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Penola

PROTECTIVE COATINGS

RUST-BAN

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RUST Preventives

CORROSION is synonymous with rust. Both are synonymous with waste. Ever since man has had metals, he has also had to combat this waste.

Millions of dollars spent annually fighting corrosion cause us to consider the protection of equipment as an economic problem with social significance. However, the plant owner, with only his own production or equipment to protect, is not so much concerned with the social significance as with his own individual problem—a problem which must be analyzed in well-defined terms.

On a moistened razor blade left in the open for a short time a reddish-brown deposit will form. This deposit is rust or iron oxide—similar to the ore from which the iron was originally obtained. There are numerous external agents which promote this tendency for the metal to return to the original condition from which it was obtained from nature, i.e., agents which cause rusting. Sulfur, moisture, acids, gases such as hydrogen sulfide and oxygen, and atmospheres containing salt are some of these agents. Electric currents also may assist in corroding metals.

CORROSION PREVENTION

There are only three known methods for combatting corrosion:

1. By the use of metals unusually resistant to corrosion.
2. By reduction of the corrosive character of the environment.
3. By the application of external protective coatings.

Little has been accomplished toward development of corrosion-resistant materials for a wide variety of industrial applications. Such alloys and special metals as are available are usually too expensive for general use.

Removal of corrosive influences from the environment surrounding the metal has made some progress, but even in indoor locations the costs are frequently out of all proportion to the savings. Obviously, metals outdoors are not subject to such protection.

PROTECTIVE COATINGS

Air, water, industrial fumes, etc., bring to the surface of metal the elements which, by their electrochemical action, attack the metal. In practically every case prevention of the waste resulting from corrosion must depend on the application of protective coatings. They are of two types:

1. Metallic Coatings

Metals such as lead, aluminum, chromium, zinc, cop-

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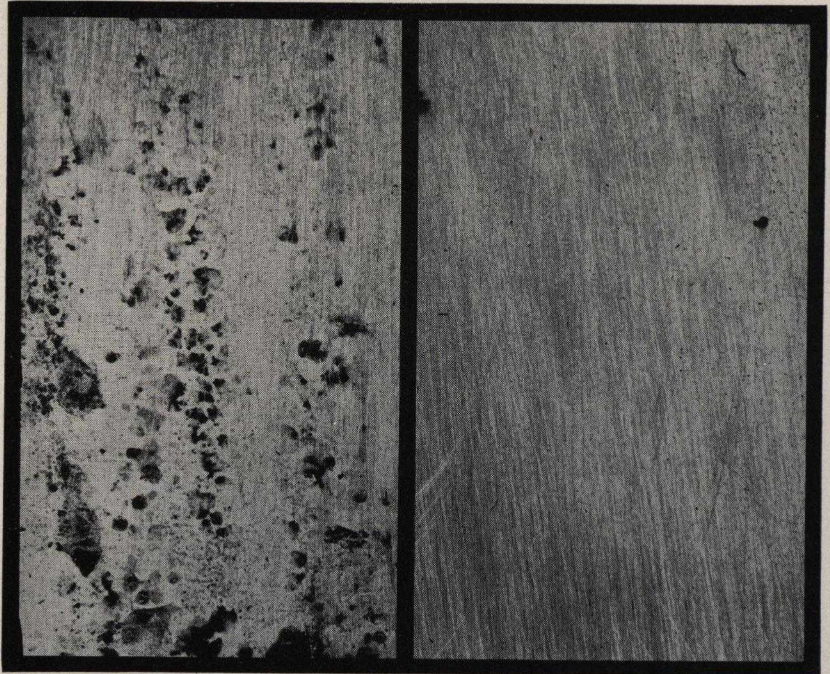
per, tin, nickel, and alloys such as Monel metal. These may be applied by painting, electroplating, galvanizing, spraying, and other methods.

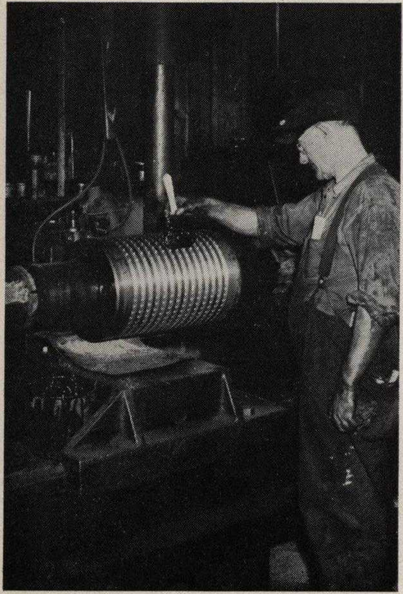
2. *Non-Metallic Coatings*
Prepared from petroleum derivatives, vegetable oils, or a combination of these to which frequently are added materials like resins, pigments and driers.

The metallic type coatings are generally expensive and have their own field of application and are not the answer to the problem confronting the great majority of industrial plants. Even where metallic coatings are used on production items, non-metallic products are frequently employed to supplement this protection.

Non-metallic coatings offer ease of application, low initial cost, durability, impermeability, sufficient elasticity to prevent cracking due to expansion and contraction, and several other features. Such characteristics make them the practical answer to the general problem of rust prevention.



How two polished steel strips look at 2⅓ magnifications after 24 hours in the severe humidifier test. The strip at the right was protected with Rust-Ban *333; at the left a competitive product was used. The effectiveness of* Rust-Ban's *special inhibitor is as apparent here as it is in service.*



Machined parts require rust protection during assembly and storage. There is a Rust-Ban *product for every need.*

RUST-BAN PRODUCTS

Rust-Ban* products are non-metallic coatings which cover a wide range of types and are divided into four principal classifications:

1. *Non-Drying Coatings*
These products range from fluid to solid consistencies, are non-drying, and can therefore be removed by wiping with rags soaked with solvent. They are often referred to as "slushing type" products—that being the most common method of application.

2. *Hard-Drying Transparent Coatings*
These are applied by common painting methods and are well suited to handling and early exposure to the weather as they dry within a short time to a hard, ductile film which cannot be easily removed.

3. *Hard-Drying Aluminum Coatings*
These products provide the greater permanence and beauty obtained with the use of aluminum pigment. The tiny particles of aluminum "interleaf" to form a continuous coat of metal over the metal and bonded to it by a vehicle which itself is an excellent protective coating.

4. *Miscellaneous Coatings*
Products other than the above are grouped together in this "miscellaneous" group. Most of these are essentially permanent in nature and include bituminous materials and primers. Also included are special thinners which have been found necessary in industry.

NON-DRYING COATINGS

(For complete information see *Lubetext*, File D239-J6, "Rust-Ban Non-Drying Coatings".)

SOLID TYPE

RUST-BAN 323

A dark brown, semi-hard drying coating for the protection of spray coils, condenser boxes, and surfaces exposed to severe corrosive conditions indoors, outdoors, under water, etc. It is of swabbing consistency, but may be heated for brush or dip application.

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* The Rust-Ban trademark is registered in the United States and elsewhere by H. O. and R. Co.

RUST-BAN 324

A semi-hard drying coating for indoor or outdoor protection of all surfaces exposed to corrosive conditions. *It must be heated* for application by dip, brush, or swab. Excellent protection for structural steel and large machinery.

RUST-BAN 325

A heavier consistency than Rust-Bans 323 and 324—used for similar applications.

RUST-BAN 327

A heavy solid material producing a dark brown, semi-hard coating for the protection of pipe lines under ground and under water, as well as those exposed to the atmosphere. Also used for steel structures, tanks, etc., protecting against the most severe corrosive agents. *It must be heated* before application.

SOLVENT TYPE

RUST-BAN 333

A fluid coating for strip steel, precision parts, machine parts, small castings, etc., where it provides excellent protection for *indoor storage* in humid or acidic atmospheres. It contains volatile material which evaporates after application, leaving a thin but effective coating on the metal. Dip, spray, or roller methods of application used.

FLUID TYPE

RUST-BAN 336

A fluid used solely for priming corroded metal surfaces such as pipe, prior to application of Rust-Ban 327. It offsets further corrosion and gives good bonding of the final protective coating.

RUST-BAN 337

A non-drying fluid heavier in consistency but for applications similar to Rust-Ban 333. Unlike Rust-Ban 333, it contains no volatile ingredients, and gives better resistance to high humidity but not to acid fumes. Recommended for *indoor protection only*.

RUST-BAN 339

A non-drying fluid heavier in consistency but otherwise similar to Rust-Ban 337. Recommended for *indoor protection only*.

SEMI-FLUID TYPE

RUST-BAN 343

A semi-fluid, non-drying protection for both indoor and outdoor use. Applied by dip, brush, or swab, to precision parts, machine parts, bar steel, large machinery, etc. It provides excellent resistance to high humidity, salt spray, acid fumes, rain, and sunlight.

RUST-BAN 347

A semi-fluid non-drying rust preventive which should be heated for application by dip, brush, or swab. It is heavier than Rust-Ban 343 and more outstanding in resistance to the same corrosive factors.

HARD-DRYING TRANSPARENT COATINGS

(For complete information see *Lubetext,* File D239-J7, "Rust-Ban Hard-Drying Transparent Coatings".)

SAFETY SOLVENT TYPE

RUST-BAN 214
RUST-BAN 216
RUST-BAN 220
RUST-BAN 222

Varnish type fluids which form hard transparent coatings. Used on all metals requiring tough, durable rust preventives. Rust-Ban 216 is the general purpose grade; the others contain larger and smaller amounts of non-volatile materials. The volatile vehicle in these products is a high boiling safety solvent of 100°F. minimum flash point.

QUICK DRYING TYPE

RUST-BAN 225
RUST-BAN 229

Fast drying varnish type fluids which form hard transparent coatings. Better suited to spray application where thinner coats are satisfactory. The volatile vehicle is a low boiling solvent with a flash point below room temperature.

HARD-DRYING ALUMINUM COATINGS

(For complete information see *Lubetext,* File D239-J8, "Rust-Ban Hard-Drying Aluminum Coatings".)

RUST-BAN 294
RUST-BAN 295

These two products are aluminum coatings of the highest quality and are widely used for protection of all types of metal surfaces. Applicable also to concrete, masonry, etc. These coatings are made with an outstanding "long oil varnish vehicle." They are supplied in two-compartment containers for job-mixing the vehicle and pigment. Rust-Ban 294 has the pigment in powder form; Rust-Ban 295 in the more popular paste form.

MISCELLANEOUS RUST-BAN PRODUCTS

(For complete information see *Lubetext,* File D239-J9, "Rust-Ban Miscellaneous Products".)

RUST-BAN 208

A fluid non-pigmented black asphaltic varnish. Dries to a

Comparison between the features of the RUST-BAN product recommended for an application and those of the product currently in use might well be made on the following:

1. What degree of protection is being secured at present?
2. Is an excessive quantity being used for the protection required?
3. Is the present material difficult to remove?
4. Is it a lubricant or does it dry and form a hard surface?
5. Is color an important consideration?
6. Does the present product drip from treated parts in storage?
7. Does it cause the parts to absorb dust and dirt?
8. Will RUST-BAN permit a simpler method of application?
9. Will RUST-BAN give better protection at the same or reduced cost?

tough flexible film. Valuable in preventing corrosion on exposed metals. Provides excellent weather resistance under severe exposure conditions.

RUST-BAN 209

A black, fluid rust preventive coating which dries to a hard glossy film. Excellent protection for exposed metal surfaces. Can be used over a primer.

RUST-BAN 263

A red lead, iron oxide, rust inhibitive primer for securing outstanding protection. Used with top coats of Rust-Ban 209, 294, or 295.

RUST-BAN Thinner 360
(Safety Solvent Type)
RUST-BAN Thinner 365
(Quick-Drying Type)

These materials are thinners for adjusting the consistency of other Rust-Ban products to that desired for certain customers' methods of application. Both are specifically designed for use with Rust-Ban. The safety solvent type, with its minimum guaranteed flash point of 100°F., is perfect for all purposes except where fast drying is necessary. The quick-drying type used for this purpose has a flash point below room temperature.

SELECTION

In determining the type and consistency of the rust preventive best suited to a particular operation, a simple but complete analysis must be made of the situation.

The severest handling and corrosion-inducing conditions which will be experienced should be determined. If storage is outdoors, the climate and length of exposure are important. If indoors, the conditions of heat, cold, dampness, or acidity must be anticipated. The duration of storage, the type of packaging and shipment, and the locality to which shipped are additional points to consider. Whether it is possible or necessary to remove the coating will dictate the choice of drying or non-drying types.

Selection of the correct consistency of product to use always represents a compromise between (1) ease of application, (2) coverage desired, (3) severity of conditions, (4) ease of removal, (5) cost. The use of increasingly heavy grades is only warranted with increased severity of conditions. The lightest grade which can safely be used is recommended in order to provide the greatest coverage per gallon.

TESTING

Many tests have been devised to evaluate rust preventives, but no single one is a satisfactory criterion for rust preventive properties on all types of materials and for all types of service.

Tests used should reflect the conditions and severity of the service for which any particular type or grade of rust preventive is recommended. A product designed for moderate service should be given a moderate test. There is no point to using a severe test, as the results on such a product misjudge its serviceability. For instance, it is not necessary that a light-bodied material, used for the protection of automotive parts stored indoors, should prove able to protect against outside weathering.

The non-drying products of the slushing type are rated on their performance in humidifier tests, water spray tests, laboratory atmosphere exposures, salt sprays, acid fumes, and also on performance under artificial and natural weathering.

The only test which has received much recognition for all the hard-drying types, including the transparent, the aluminum, the bituminous coatings and the primers is that of natural weathering on test panels exposed outdoors and facing south at a 45° angle. All of these, however, are best evaluated by actual service results.

In subsequent *Lubetext* sections the various types of rust preventive products and the Rust-Ban grades in each type are discussed in detail.

Descriptive Sections on RUST-BAN Products published in *Lubetext*

"Rust-Ban Non-Drying Coatings"	File D239-J6
"Rust-Ban Hard-Drying Transparent Coatings"	File D239-J7
"Rust-Ban Hard-Drying Aluminum Coatings"	File D239-J8
"Rust-Ban Miscellaneous Products"	File D239-J9

NON-DRYING COATINGS

RUST-BAN coatings of the non-drying type have an extremely wide range of application. Their popularity and great adaptability are based on such characteristics as the following:

1. Excellent protection.
2. Sufficient durability accomplished with economy.
3. Freedom from hardening or cracking, peeling, or slipping from the metal surface.
4. Ready removal of coating with petroleum solvents.
5. Since these coatings provide lubricating films they need not be removed for many subsequent uses of the treated part.

NEW RUST INHIBITOR

Non-drying coatings, or "slushing compounds" as they are frequently called, have in the past consisted mainly of various oils, greases, and petrolatums. They were the best products obtainable until now. While they proved adequate in many places, they left much to be desired. Experiments have proved that additional constituents must be present which, by chemical or other action, will offset the electrochemical conditions causing rusting.

Behind the development of the non-drying RUST-BAN coatings is a long time research program to perfect special rust preventive agents. This program has succeeded. *Into these* RUST-BAN *products goes a special compound which definitely inhibits rust formation.* The petroleum products utilized in making the various RUST-BAN coatings are themselves a shield against rust. Augmenting this protection, however, is the special rust preventive compound incorporated to offset penetrating action of corrosive agents.

EVALUATION

The effectiveness of RUST-BAN products as rust preventives is readily demonstrable by test. Most commonly used are certain accelerated laboratory tests. Of these, three are particularly significant: the humidifier test, the water spray test, and the salt spray test. These are tests standardized and used in the evaluations of RUST-BAN non-drying coatings.

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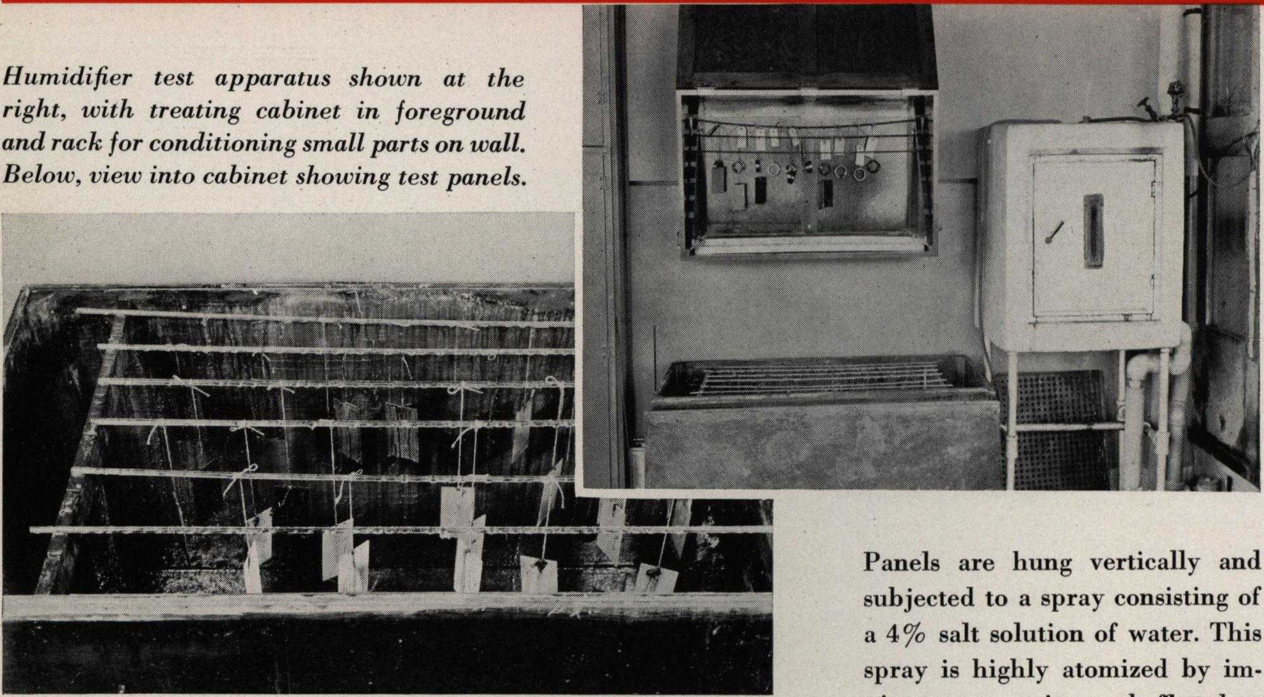
Humidifier test apparatus shown at the right, with treating cabinet in foreground and rack for conditioning small parts on wall. Below, view into cabinet showing test panels.



HUMIDIFIER TEST

In the humidifier test, metal panels are coated with rust preventive and placed in a special cabinet through which air passes at the rate of 12 cubic feet per hour. This air is maintained at 100% humidity, heated to 100° F., and directed into the cabinet against baffle plates which insure uniform air distribution. The rate of flow of air through this cabinet is critical in determining the breakdown period required. Under static air conditions certain coatings may last months in this cabinet. With air circulating, the time of breakdown is accelerated to a matter of hours.

Coatings comparable in purpose and consistency are placed on special test panels and the measure of quality is the number of hours elapsed before initial corrosion takes place, as determined by visual examination of the surface. The humidifier test gives a good indication of the merit of products used for indoor or protected outdoor storage where humidity and temperature variations are the main corrosive influences. Products which are rated "good" in the humidifier are not necessarily of merit for full outdoor exposure.

WATER SPRAY TEST

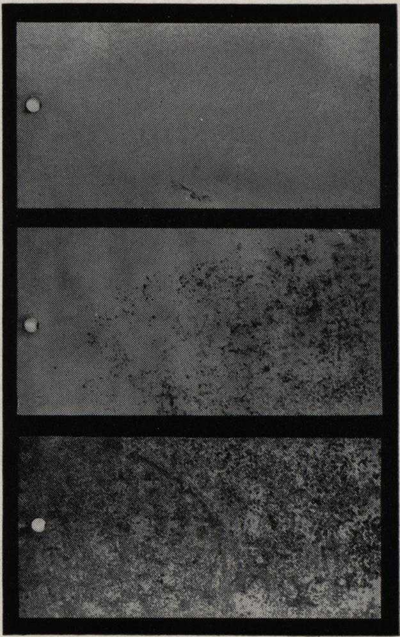
In the water spray test, panels are placed at a 30° angle from the horizontal and subjected to a 2 feet fall of tap water. This water is maintained at 75° to 80° F. and allowed to "rain" on the panels for 3 minutes, then is turned off for 3 minutes. The cycle is repeated until the coatings fail and the first signs of corrosion appear. This test evaluates the strength and resilience of the protective film against the impingement of water.

Strangely enough, some products which protect nicely from heavy weathering (as rated on the water spray test) are not outstanding in humid atmospheres. This means that for full outdoor exposure the best protection will come from a product rating good in both the humidifier and the water spray tests.

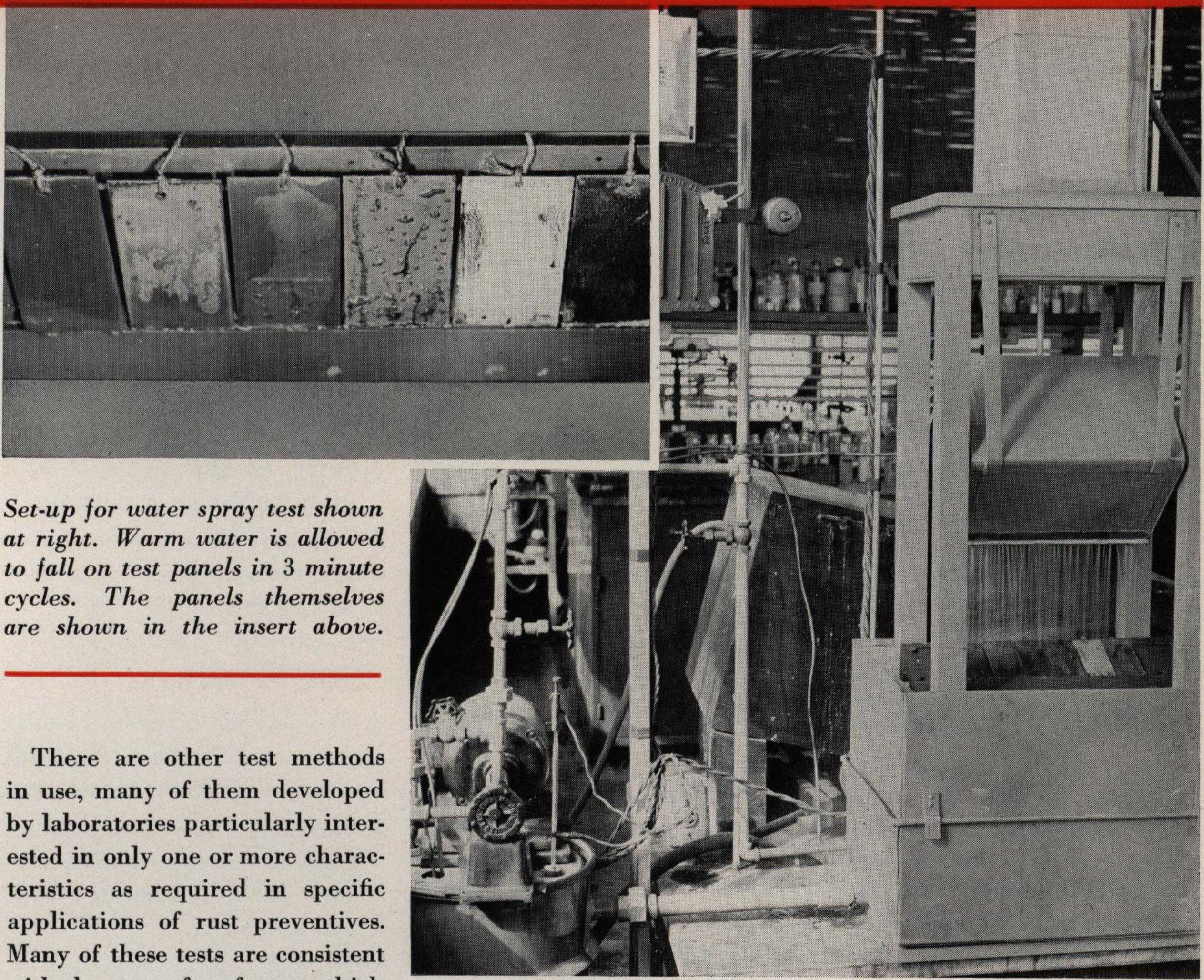
SALT SPRAY TEST

For the salt spray test, a specially constructed cabinet is used. Panels are hung vertically and subjected to a spray consisting of a 4% salt solution of water. This spray is highly atomized by impingement against a baffle plate and then passes over the panels.

The salt spray test simulates in an accelerated manner the severe conditions found near the seashore or when shipment is made by boat. Salt water stimulates corrosion more than fresh water since it provides a better medium for electro-chemical action.



Steel panels after 5-day salt spray test. RUST-BAN 347 *used on top panel, competitive products used on other two.*



Set-up for water spray test shown at right. Warm water is allowed to fall on test panels in 3 minute cycles. The panels themselves are shown in the insert above.

There are other test methods in use, many of them developed by laboratories particularly interested in only one or more characteristics as required in specific applications of rust preventives. Many of these tests are consistent with the type of surface to which the coating is to be subjected. Others, however, are homely devices which actually do not reflect the conditions important to the service for which the product is intended, and as such they give erroneous comparisons. The common fault with testing rust preventives is the use of tests which are unfair or neglect to cover some corrosive factor which does occur in actual use. *Actual service results are the final check and are always to be preferred.*

CONSISTENCY

Fluid materials are readily applied and give a high coverage per gallon, but they cannot be expected to provide as effective a coating as heavier materials which give less coverage because they are applied in appreciably thicker coatings. Nor need the thinner coatings be expected to compete with the thicker ones, for each has its particular type of application and, when correctly used, gives adequate protection for the service experienced. The use of increasingly heavy grades is only warranted with increased severity of conditions. The lightest grade which is possible to use is always recommended in order to provide the greatest coverage per gallon.

SPRAYING

Although these products are commonly called "slushing compounds," they are applied by a number of different methods, most common of which are dipping, spraying, and swabbing. In deciding the best type of application for any given conditions, such factors as the consistency of the coating, type of surface, and desired speed of application are important.

Spraying is generally restricted to products which are fluid at room temperature. Heavier products which have to be melted experience mechanical difficulties such as arise from the product cooling in the spraying equipment. Heavy material may be sprayed by diluting it with a solvent, but this involves possible hazards and mechanical difficulties. Technical advice is often needed on spray applications.

Standard spraying equipment is usually satisfactory. Pressure applied to the feeder line should be no greater than necessary to deliver the product to the sprayer

Pipe sections and nipples are subjected to caustic bath at right to remove cutting oil, rinsed, then dipped in this bath of fluid type rust preventive to protect them during storage.

and produce the width and atomization desired.

DIPPING

The dip method is generally used for products fluid at normal temperatures. Heavier products are frequently heated to permit their application by this method. Parts to be treated may be suspended in baskets or on hooks and then lowered into the tank. Sufficient rust preventive should be used to avoid excessive chilling when cold parts are dipped. When dipping methods are used, the articles being treated should remain in the product until warm and then suspended so the excess Rust-Ban flows back in the reservoir. In order to obtain a thin film on metal parts, it is advantageous to leave them in the bath until they reach equilibrium temperature.

Where materials containing volatile solvents are used, provision must be made for removal of any accumulation of vapors. Where products are heated, too rapid heating is to be avoided to prevent deterioration of the product.

OTHER METHODS

Swabbing is the simplest method and often the only one possible with large pieces of machinery. The consistency of the rust preventive applied is frequently lowered by heating, thus making possible fairly high coverage with durable type products.

Modifications of these methods are numerous, among which are:

1. Spray or dip method, with parts moving on a conveyor.
2. Treating flat sheets as they pass through processing rolls—as in a strip mill.
3. Circulating spray systems, reusing the drainings.
4. The passing of parts, usually flat forms, between felt rolls saturated with rust preventive.
5. Tumbling parts in barrels or boxes containing waste or sawdust which is saturated with rust preventive.
6. Turning parts over with a shovel and sprinkling by hand.

Steel mill rolls receiving hand application of non-drying coating to protect while rolls are in storage.

RUST-BAN NON-DRYING PRODUCTS

SOLID TYPE

RUST-BANS 323, 324, 325 AND 327

These four products are intended for outside use where severely corrosive conditions require a permanent, highly resistant, semihard coating. They are used where paints or varnishes are not applicable. Instead of forming a firm, dry coating which cannot be removed, these products produce films which harden slowly on the outside but remain soft and plastic next to the metal.

In two weeks to several months, depending on the weather conditions, these coatings form a semihard surface film. Underneath this film they retain their original consistency and self-healing properties.

They seal the pores of the metal, expand and contract with changing temperatures, and effectively inhibit and prevent rust formation. They are unaffected by whatever chemical action is encountered in their normal application. They provide corrosion resistance under difficult conditions, and achieve this permanence and durability at low cost.

Rust-Bans 323, 324, 325 and 327 differ essentially from each other only in consistency. Rust-Ban 323 is the lightest, the other grades being progressively heavier, with Rust-Ban 327 the heaviest and producing the thickest and most durable coating.

METHODS OF APPLICATION

While Rust-Ban 323 may be swabbed as received, it is often heated. Rust-Ban *324, 325, and 327 must be warmed before using.* Gas flames, steam or hot water, electricity or open fire may be used — care being taken to prevent flames coming in contact with any of these products. Stirring is not necessary after the products are heated and have become fluid. The temperatures at which these Rust-Ban products are usually applied are approximately as follows:

Rust-Ban 323
Swabbed as received; 150°F. for brushing; 180°F. for dipping.

Rust-Ban 324
140°F. for swabbing; 170°F. for brushing; 200°F. for dipping.

Rust-Ban 325
100°F. for swabbing (in summer no heating required); 170°F. for brushing; 200°F. for dipping.

Rust-Ban 327
175°F. for swabbing; 200°F. for brushing; 225°F. for dipping.

Surfaces to be treated should be clean and free from rust, mill scale, moisture, and grease. Where Rust-Ban 327 is to be applied to corroded pipe, and it is impractical to remove the last trace of rust, a primer such as Rust-Ban 336 should be first applied. Such a primer thoroughly wets the metal with an oily film which displaces any moisture, inhibits further rusting, and permits good bond of the finished coating.

COVERAGE

Coverage depends on the thickness of coating applied, but under average conditions and at the above recommended temperatures these Rust-Bans give the following approximate coverage:

Rust-Ban 323
20 square feet per pound.

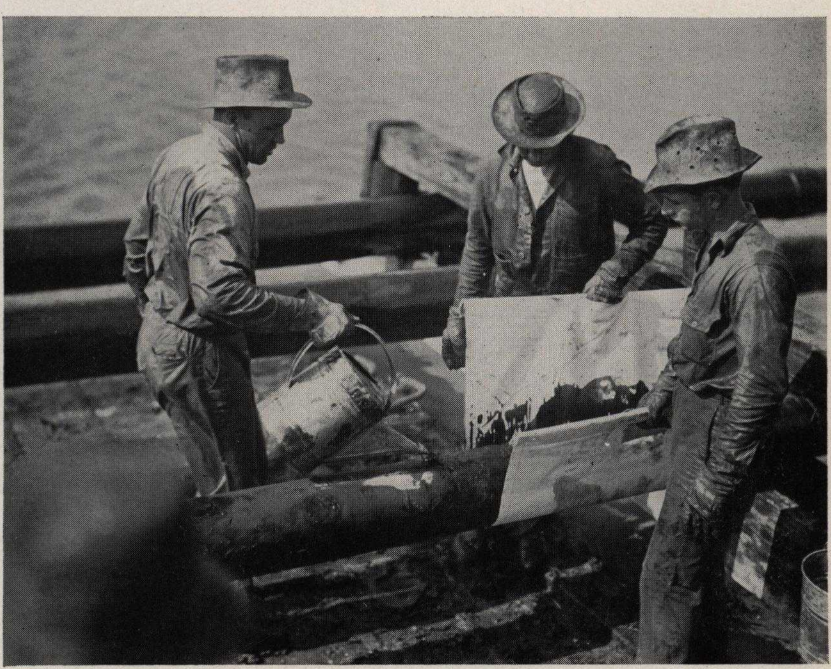
Rust-Ban 324
18 square feet per pound.

Rust-Ban 325
15 square feet per pound.

Rust-Ban 327
10 square feet per pound.

PERFORMANCE

Field experience with these products has been extensive and the



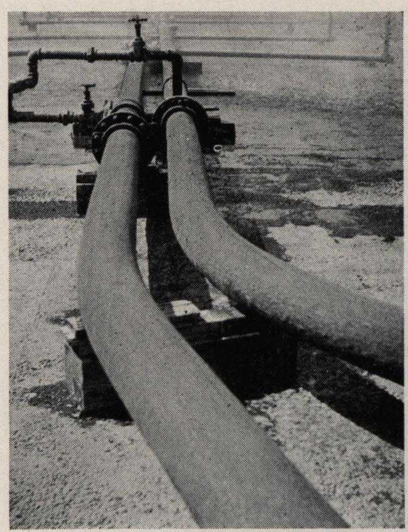
Application of Rust-Ban 327 *to pipe by the "can and sling method." The product is heated until fluid, then poured from can onto top of pipe. Sling is used to spread product evenly around pipe.*

results achieved have been outstanding. One large steel corporation has standardized on using Rust-Ban 324 for coating car axle journals during storage and shipment. Quoting from this company's final report, "An examination of the specimens coated heavily with this compound shows no staining after nine weeks' immersion in fresh water, 3% salt water, or exposed to coke plant atmospheres. We recommend this material as our protective coating for application on dry metal surfaces. Our tests show this compound superior to ——— which has been approved for such use, because it adheres firmly to metal surfaces even under summer temperatures and exposed to direct sunlight. We prefer Rust-Ban 324 over ——— because of its adhesive quality, protecting better against abrasive influences."

USE ON PIPE LINES

Rust-Ban 327 is used extensively on pipe lines owned by the makers of Rust-Ban.

On pipe lines crossing open water no wrapping is required. It is recommended for use on underground pipe provided a wrapping of felt is added to improve the strength of the coating and to prevent absorption of it by the soil.



This pipe is subject to continuous water spray, yet is well protected by Rust-Ban.

The usual method is to apply Rust-Ban 336 first as a primer, and then Rust-Ban 327 by the "can and sling" method. This involves pouring the product on the upper surface of the pipe from a can (similar to a garden sprinkler with the head removed) and following closely with a rag, which spreads the coating around the pipe with a whipsaw motion in an average thickness of 3/32 of an in inch. A portable hand-wrapping machine is usually used and follows closely behind the crew applying Rust-Ban 327. The pipe is wrapped spirally for best results, with enough tension applied to force a small bead of the Rust-Ban 327 out at each lap, thereby insuring a positive seal.

TYPICAL APPLICATIONS

RUST - BAN 323, RUST - BAN 324, RUST-BAN 325

- Bolts
- Buffer plates
- Car door rollers
- Condenser boxes
- Connecting rods
- Drill bits
- Fittings
- Ice cans
- Marine equipment
- Protection against salt water and hydrogen sulfide
- Railroad car axles
- Spray coils
- Sweating pipes
- Threads
- Turntables
- Valves

RUST-BAN 327

- Acid concentrators
- Bridge cables
- Couplings
- Pipe lines, exposed
- Pipe lines, underwater
- Pipe lines, underground
- Protection against brine drippings, hydrogen sulfide and salt spray

SOLVENT TYPE

RUST-BAN 333

This product contains a high percentage of volatile solvent as a vehicle into which has been incorporated the newly perfected rust preventive compound. Upon

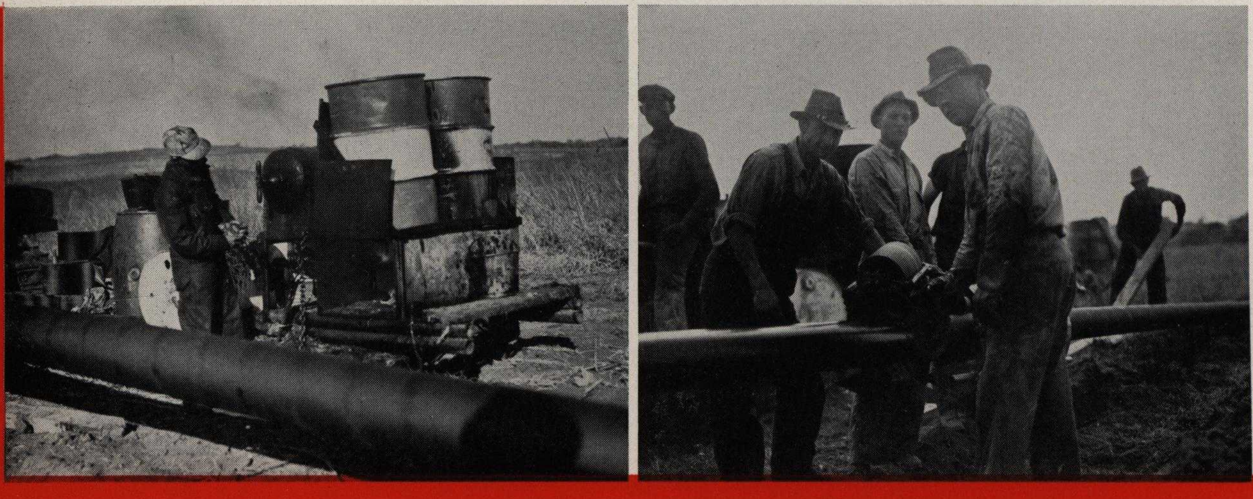


Photo at left shows portable unit set up for heating solid type rust preventive on the job to render it fluid enough for pouring onto pipe. Hand wrapping machine is shown at right. It spirally wraps pipe which is to be placed underground.

application, the solvent evaporates and leaves on the metal surface a thin, almost invisible but highly effective film of protection. This film does not dry but remains flexible and tacky over long periods. It is designed solely for indoor protection against both humid and acidic atmospheres, and *is not recommended for use exposed to the elements.*

METHODS OF APPLICATION

Application of this product is by dip, spray, or roller. It is used on strip steel, precision parts, small castings, and similar small hardware where an oily film is not desired.

RUST-BAN 333 gives good protection against high humidity and acid fumes, and fair protection against rain, sunlight and salt spray. Whereas samples of competitive products examined failed in the humidifier test in two to three hours, RUST-BAN 333 protected for 120 hours. These are accelerated test conditions and do not give the actual life to be expected. Comparisons in actual practice have substantiated these test results. Another characteristic of RUST-BAN 333 is that it provides an almost invisible film on the metal while many competitive products give a rather mottled appearance.

The flash point of RUST-BAN 333 is 100°F. minimum and therefore precautions should be taken toward removal of accumulations of vapors arising from spray applications. Coverage on dip application is approximately 1200 square feet per gallon.

PERFORMANCE

There are numerous examples of RUST-BAN 333 proving unusually useful in customers' plants. A continuous strip mill tested it on polished panels of cold rolled strip, located within 50 to 75 feet of a pickling bath. In three weeks competitive products had permitted rusting, while the RUST-BAN coated panels were still in perfect condition.

At another strip mill test panels were given a "satin finish" and exposed to laboratory atmospheres in which hydrochloric fumes predominated. In ten weeks the competitive product had failed, while the RUST-BAN panel was still bright and clean. Tests in the same laboratory with a 25% salt spray solution caused failure of the competitive product in six hours, while at the end of 43 hours RUST-BAN 333 still gave perfect protection.

At another strip mill RUST-BAN 333 was applied to tons of steel set aside in a warehouse for three months. During that time material treated with the competitive product had to be sprayed several times to prevent rusting.

One of the widest uses of the solvent type rust preventive is on steel sheets. The machine shown applies the protective coating which must prevent rusting while the sheet is awaiting forming.

Steel dies spend most of their time in storage. Rust preventive must protect and yet be readily removed when die is used. Hand dipping into solvent or semi-fluid type of product is common.

One application of Rust-Ban gave complete protection plus the added advantage of superior appearance.

FLUID TYPE

RUST-BAN 336

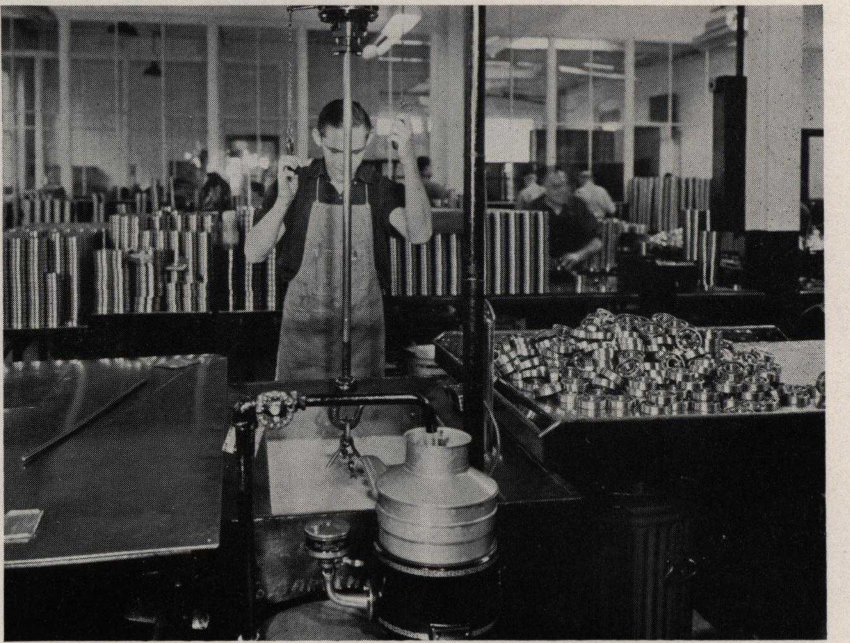
This is a special oil base product *not intended for use primarily as a rust preventive.* Rather, it is a primer over which the heavy solid Rust-Ban coatings are applied, particularly Rust-Ban 327. It is useful on metal surfaces where previous traces of corrosion have not been entirely eliminated. Applied to these surfaces it penetrates the rust, removes moisture, inhibits further corrosion, and provides a good bond for the later application of the solid type Rust-Ban coating. Coverage is approximately 700 square feet per gallon.

RUST-BAN 337

This product is useful in the same applications as Rust-Ban 333 but is heavier in consistency, contains no solvent, and gives somewhat better protection. Being made from a lubricating oil base, it provides an oily film on the metal surface rather than the slightly tacky film formed by Rust-Ban 333. It has a Saybolt viscosity of approximately 150 sec. at 100°F. It is applied by dip, spray, or roller. On dip application this product has a coverage of approximately 650 square feet per gallon. Being entirely fluid it does not require heating. Rust-Ban *337 is recommended solely for indoor protection against humid but not acidic atmosphere.*

PERFORMANCE

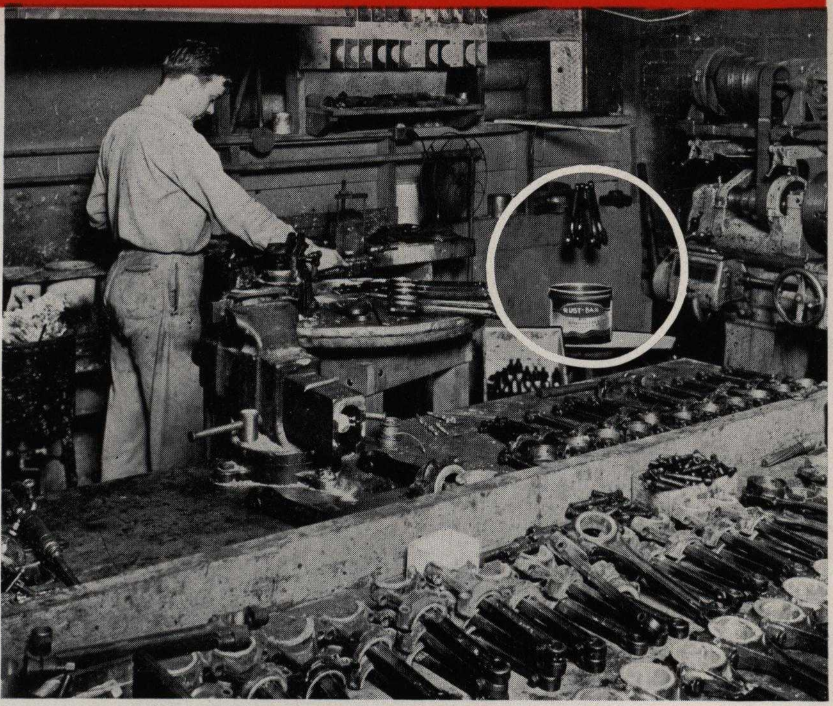
On the humidifier test Rust-Ban 337 withstands over 500 hours exposure while samples of competitive products which were tested failed in anywhere from 1 to 45 hours. A manufacturer of sewing machine needles obtained interesting results with this product on a salt spray test. This test had previously been correlated with field service results where it had been found that 5 weeks' protection in the laboratory test on needles coated and wrapped was equal to approximately five years normal storage even in warm humid atmospheres common in the Dutch East Indies.



This is the method employed by a leading manufacturer for treating finished ball bearings. Semi-fluid product is heated and bearings are dipped in a wire basket. Immediately following, bearings are wrapped in oil-proof paper and sealed in cartons.

The best coatings heretofore had protected for 5 weeks in the laboratory test and the manufacturer was pleasantly surprised that Rust-Ban 337 gave protection for over 14 weeks — this, of course, will mean substantially longer protection for these parts in service

In another instance, artillery shells coated with Rust-Ban 337 and stored for more than three months in atmospheres more corrosive than normal to manufacturing plants were perfectly protected. Additional advantages of Rust-Ban 337 over other products tried were its greater ease of handling, better coverage, and substantially better appearance.



Shops handling a variety of machined parts can well utilize semi-fluid rust preventive for treating parts. Rust preventive is readily removed with a rag soaked in petroleum solvent.

RUST-BAN 339

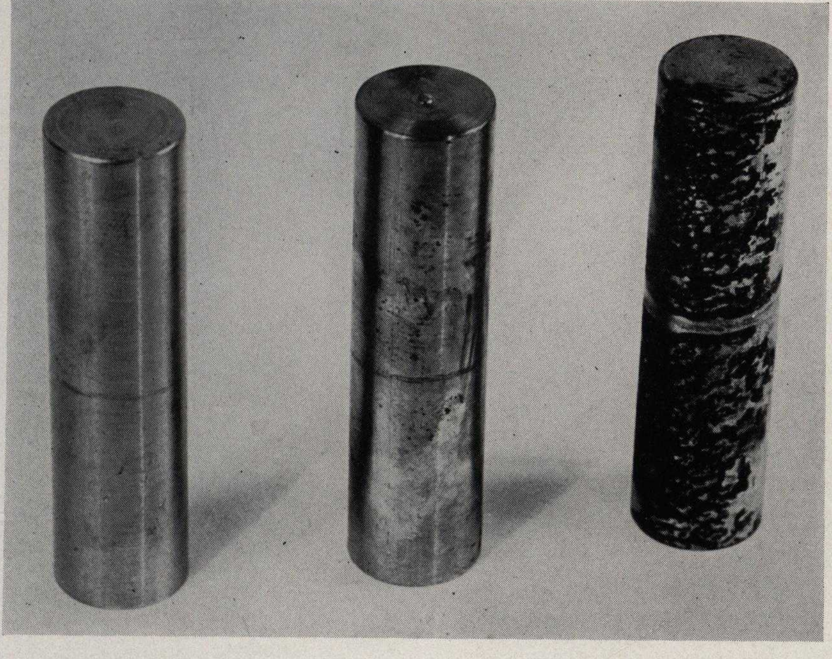
Rust-Ban 339 is heavier in consistency than Rust-Ban 337 and 333, and gives longer protection under the same corrosive conditions. It is similar to Rust-Ban 337 but has a Saybolt viscosity of approximately 835 sec. at 100°F. Its coverage when applied by dip methods is approximately 400 square feet per gallon.

PERFORMANCE

Over 500 hours exposure in the humidifier test failed to break this film, while competitive products of similar consistency failed in well under 100 hours.

A leading ball bearing manufacturer tested Rust-Ban 339 in a static humidifier where air was maintained at 100°F. and a humidity of 95%. This product gave perfect protection to bearings over 6 months in this test—substantially better performance than the manufacturer had previously obtained.

Rust-Ban 339 has been adopted by a large manufacturer of circular band saws. The saws are treated upon emerging from final tempering and then are placed in open crates for shipment to all parts of the world. This Rust-Ban product has corrected corrosion tendencies which have disturbed the manufacturer of these units for the past 30 years.



Highly polished ¾″ steel rods which have been stored in water for 5 days in accordance with U. S. Navy Distilled Water Test. Rust-Ban 337 was used at left; other two bars had been coated with competitive products.

SEMI-FLUID TYPE

RUST-BAN 343

This product is particularly suited to dip applications of materials which are to be stored *either* *indoors or out.* The thickness of film provided is sufficient to protect against the impingement of rain and makes this product entirely suitable for normal outdoor exposure. However, when extended outdoor storage is contemplated, it is always advisable to use somewhat thicker coatings, such as RUST-BAN 347 or 324.

While designated as semi-fluid, this product can be poured at normal room temperatures. It may be heated for ease of application where desired. Usual application is by dip, brush, or swab. Coverage on dip application approximates 200 square feet per gallon.

PERFORMANCE

RUST-BAN 343 affords metals excellent resistance to the effects of humidity and acid fumes. In the humidifier test, this product passes the 500 hour mark (the limit of the test) while the competitive products tested failed in as little as 5 hours, the best lasting only 139 hours. Other tests indicate that RUST-BAN 343 gives good resistance to rain, sunlight, and salt spray.

Among current users of this product are roll shops at steel mills where hardened steel rolls are protected during storage. Manufacturers of molded products are also finding this material ideal for protection of molds in storage. The fact that RUST-BAN 343 is readily removable when the mold is needed again is particularly important in this operation.

This product, and RUST-BAN 347 are frequently recommended for protection of machinery shipped extended distances, especially by boat.

RUST-BAN 347

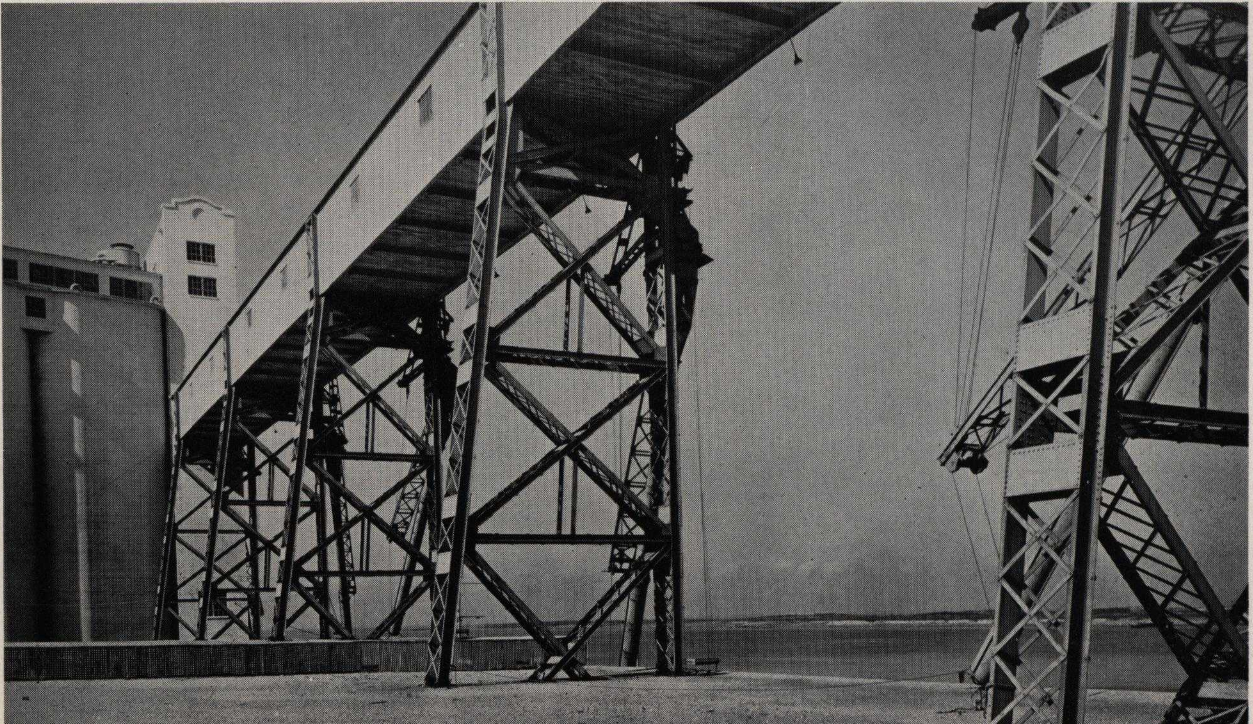
This RUST-BAN coating is semi-fluid, having a pour point above normal room temperatures and requiring heating for dip application. Brush or swab application may be accomplished without heating in summer, although heat is normally applied to gain coverage and ease of handling. This coverage on dip application is approximately 200 square feet per gallon with the temperature at 130°F.

PERFORMANCE

RUST-BAN 347, *used indoors or out,* gives outstanding protection to bar steel and large machinery. Excellent results are obtained on water and salt spray tests. The humidifier test gave a rating of 500 hours plus. Competitive products which were tested failed in 50 to 145 hours.

A large manufacturer of steel mill rolls has found this product quite desirable for coating the rolls when they are machined and to protect them during shipment. Other uses already demonstrated have been for protection of firearms and idle paper mill equipment.

Semi-fluid RUST-BAN *used on the cables at this grain elevator has had a good record withstanding wheat dust and strong salt atmosphere. The structure itself is an ideal application for aluminum coating.*



GENERAL RECOMMENDATIONS FOR RUST-BAN NON-DRYING COATINGS

Product	For Application to										Storage Conditions		Method of Application				Temperature of Application			Approximate Coverage sq. ft./gal.
	Precision Parts	Machine Parts	Small Castings	Strip Steel	Bar Steel	Large Machinery	Structural Steel	Pipe Lines			Indoors	Outdoors	Dip	Spray	Brush or Swab	Roller	Room	Warm	Hot	
RUST-BAN 323						X	X				X	X	X		X			X	X	160 @ 150°F.
RUST-BAN 324						X	X				X	X	X		X			X	X	150 @ 170°F.
RUST-BAN 325						X	X				X	X	X		X			X	X	120 @ 170°F.
RUST-BAN 327						X	X	X			X	X			X				X	80 @ 180°F.
RUST-BAN 333	X	X	X	X							X		X	X		X	X			1200
RUST-BAN 337	X	X	X	X							X		X	X		X	X			650
RUST-BAN 339	X	X	X	X							X		X	X		X	X			400
RUST-BAN 343	X	X			X	X					X	X	X		X		X	X		200
RUST-BAN 347					X	X					X	X	X		X		X	X		200 @ 130°F.

NOTE: All grades may be removed by wiping with rag soaked in petroleum solvent. RUST-BAN 336 is especially suited as a primer for application prior to RUST-BAN 327, and not as a final protective coating.

PENOLA INC.

CHICAGO PITTSBURGH
ST. LOUIS DETROIT

RUST-BAN

Reg. U. S. Pat. Off. by H. O. and R. Co.

HARD-DRYING TRANSPARENT COATINGS

Rust-Ban Hard-Drying Transparent Coatings are designed primarily for use where a durable, non-removable, protective coating is desired. This coating is normally expected to act as a rust preventive only during the interval between application and final assembly or use of the metal parts. At that time the coating ceases to be necessary and is either machined off, left to wear off, or painted over with pigmented products. Where surface markings, numbers, imperfections, etc., must be visible, transparency of the coating is obviously important.

WIDELY APPLICABLE

Structural shapes, boiler plates, machined surfaces, pipe and castings require the protection of this type of Rust-Ban between the time of their fabrication and the time of their assembly into the finished form. Every branch of heavy industry has some equipment requiring the use of a hard drying transparent rust preventive.

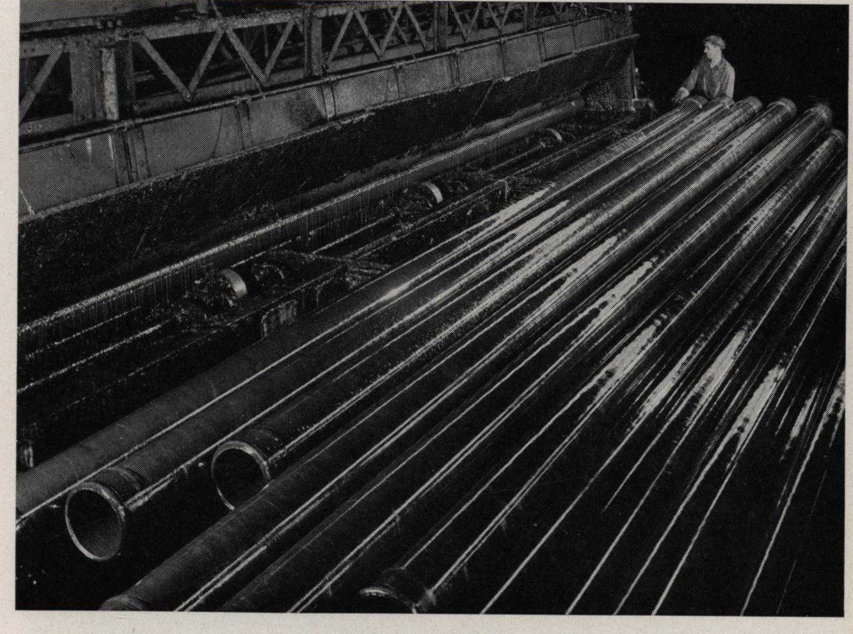
The hard-drying, transparent Rust-Ban coatings meet every requirement of this service: they are durable, hard, transparent, water and wear resistant, and less expensive than paints.

EXCELLENT PROTECTION

They are a combination of a volatile solvent, which controls the rate of drying, with a non-volatile portion which becomes the permanent coating. Skillful processing, blending, and control produce a wear and weather resistant protective film which seals the surface of metal from air and water.

There are other products which have been offered for this service for some time. They, too, form varnish-like coatings. A great deal more is required, however, and it is in such respects many competitive products usually fail. An even and controlled rate of drying is necessary, and for this the product must be suited to the customer's production methods. Durability and ductility are necessary to protect and continue to seal metal from air and water, despite rough handling, effects of rain, or mildly corrosive fumes. In addition, the product must not be excessively volatile, for thereby arise hazards to persons and equipment.

The Rust-Ban hard-drying transparent coatings meet all



Pipe coating machine applying hard-drying transparent rust preventive to protect pipe during storage and shipment.

Printed in U. S. A.—12-15-38.

Copyright 1938, Penola Inc.

these requirements and in addition are exceptionally durable. They stay put, do not drip or peel, and have sufficient elasticity that rough handling and expansion of the metal have little effect on the film. Further, they resist deterioration due to sunlight, mildly corrosive solutions or fumes, and both fresh and salt water. The film does not interfere with subsequent forming or machining operations.

COVERAGE

The coverage to be expected, in terms of square feet per gallon, varies considerably with the consistency, the thickness of the applied film, the technique of the workman, and the method of application. Thin first coats on non-absorptive metal surfaces should cover 600 to 700 square feet per gallon. Greater coverage than this usually results in a film so thin that surface protection is largely lost. The solvent used is so refined to control evaporation that it assures even application and proper drying, thereby providing more satisfactory coverage than most competitive products.

RUST-BAN 214, 216, 220, AND 222

Safety Solvent Type

These four grades of Rust-Ban are made with their volatile portions having a minimum flash point of 100°F. They are amber colored liquids which are applied in thin films and dry to hard, durable coatings. They are non-pigmented and the coating formed is transparent. The difference between these grades lies in the amount of non-volatile material contained in each.

Rust-Ban 216 is the most generally used coating because its consistency is such that it is readily applied by all common methods: brush, dip, wipe, and spray. It requires no dilution. The coating formed is of the thickness most generally desired. Rust-Ban 214 forms a somewhat thinner coating, while Rust-Ban 220 and 222 form progressively thicker coatings. As 220 and 222 are somewhat heavier in consistency than that best suited to usual applications, they can be cut back with Rust-Ban Thinner 360 to give any consistency desired by the customer.

These products "set to touch" in about 4 to 6 hours under average drying conditions, and dry hard in 24 hours.

TYPICAL APPLICATIONS

Angle bars
Boiler plate—after pickling
Bits—storage or transit
Castings
Forming equipment
Manufactured articles
Machined surfaces
Pipe and pipe fittings
Ship plate—after pickling
Steel rails
Tools in storage
Tractor parts
Wheels

OTHER FIELDS

Certain special uses have developed for these products. Rust-Ban 220 is applied in waterproofing awning, canvas, and tarpaulin stock. Sweet potato growers find this grade excellent as a replacement for bodied linseed oil for treating the muslin coverings used in their fields. Rust-Ban 222 is used as a cut-back for oil paints, gaining faster drying characteristics than available with linseed oil as well as notable improvement in the weather resistance of the paint reduced with it.

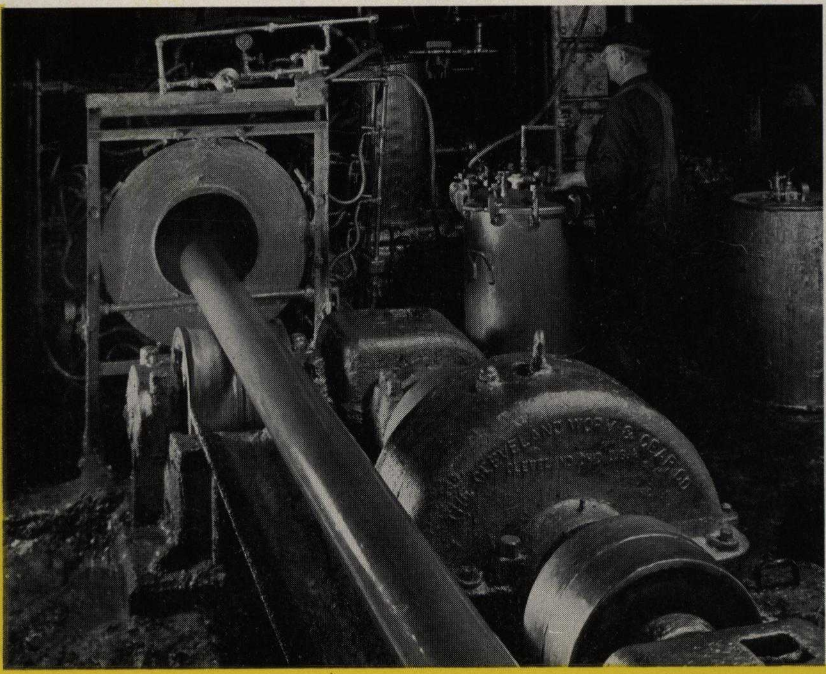
RUST-BAN 225 AND 229

Quick Drying Type

Both these products are made with their volatile portion of the quick drying type, and therefore have flash points below room temperature. Like the other hard-drying transparent Rust-Ban coatings, they are permanent rust preventives.

APPLICATIONS

Rust-Ban 225 is the thinner of the two. It is designed for very fast drying, being applied by



Automatic spray-coating of new pipe. Hard-drying transparent product ideal for this field.

spraying without dilution. It produces a very thin, tough, transparent coating suited to many applications where heavier films are unnecessary and where production methods benefit by the accelerated drying. Automobile parts, tool stock, toys, manufactured articles, sporting goods, etc. are typical applications.

The other product, Rust-Ban 229, is also a fast drying grade. It forms a heavier film than the 225 grade. Applications are similar to the general purpose Rust-Ban grades.

Both products "set to touch" in about 2 to 3 hours. Rust-Ban 225 dries hard in about 13 hours under average drying conditions; Rust-Ban 229 in about 18 hours.

They provide protection against corrosion during storage, shipment, and handling of such materials as fittings, tools, rails, bridge sections, machine parts, bar stock, etc.

METHODS OF APPLICATION

Application is by all methods common to painting, plus such special installations as have been designed to flow or spray coatings on materials at rapid production rates. Spraying, dipping, and brushing grades are provided. In addition, thinners are available to adjust consistency and drying to special customer needs. The dip method is often preferred due to the ease of application and the freedom from troublesome petroleum vapors attendant to spraying. Such vapors form a potential fire hazard.

While the flash points of the spraying grades of these Rust-Ban coatings are high for products of this type, they are within ordinary room operating temperatures. Therefore, all spraying must be removed from open flames, and a ventilating system provided and kept operating to remove vapors before combustible mixtures can be formed with air.

The grades of Rust-Ban for wipe, brush, and dip applications have a flash point of 100°F. and therefore are not as susceptible to ignition, enjoying a considerable advantage over competitive products in this respect.

SURFACE PREPARATION

The surface to be treated should be dry, clean, and free from all mill scale, dirt, and rust. Oil and grease should be removed by washing with one of the Rust-Ban Thinners or similar solvent; *do not use kerosene.*

Surfaces that have been previously painted or are badly corroded should be wire brushed and cleaned since rust particles adhering to the surface destroy the bond between the coating and the metal.

Rust-Ban products should not be applied when the surface shows any signs of moisture, condensation, or frost, as this would tend to permit corrosion to take place under the film, as well as cause the coating to peel and crack.

DRYING RATES

The majority of these Rust-Ban products are of the correct consistency to apply without dilution. Their drying rates are designed to meet a variety of conditions. The fast drying grades are desired where treated pieces must be handled and stored quickly. These products should not be diluted. The Safety Solvent grades may be thinned when spraying consistency and quicker drying are preferred, but this is done at a sacrifice of film thickness.

When exposed to the atmosphere in buckets, troughs, and other open containers evaporation is comparatively slow. If, upon continued exposure to air, some thickening is observed, it is necessary to thin only to the desired consistency with the correct Rust-Ban Thinner.

Familiar garden sprayer used to apply Rust-Ban *throughout mill yard.*

THE ESSO MARKETERS

STANDARD OIL COMPANY OF NEW JERSEY
NEWARK · BALTIMORE · RICHMOND
CHARLOTTE · CHARLESTON, W. VA. · COLUMBIA

STANDARD OIL COMPANY OF LOUISIANA
MEMPHIS · NEW ORLEANS · LITTLE ROCK

STANDARD OIL COMPANY OF PENNSYLVANIA
PHILADELPHIA

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RUST-BAN
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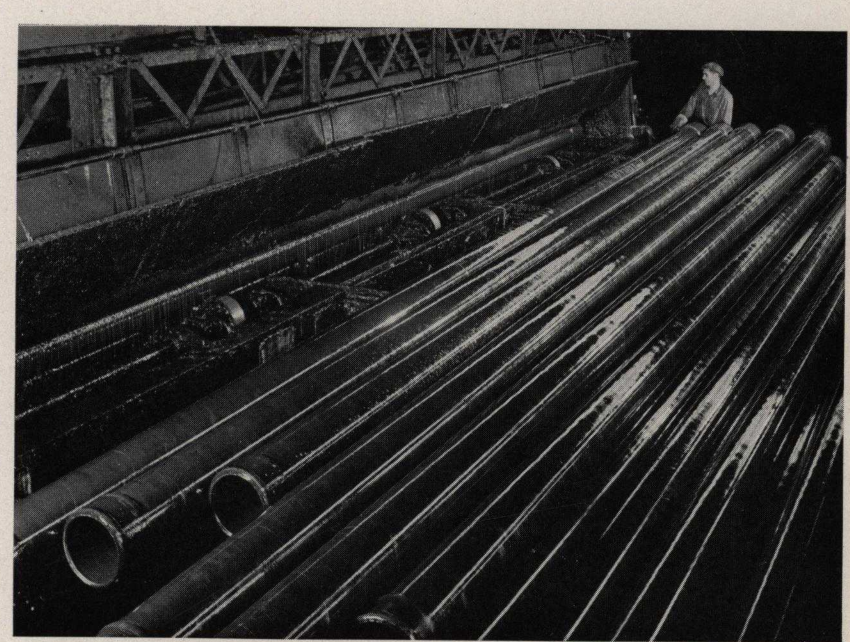

Pipe coating machine applying hard-drying transparent rust preventive to protect pipe during storage and shipment.

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APPLICATIONS

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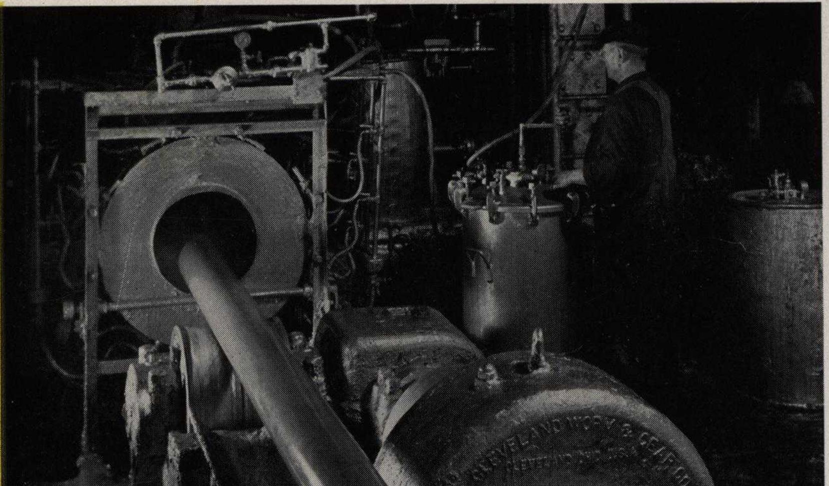

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PHILADELPHIA

COLONIAL BEACON OIL COMPANY
BOSTON · NEW YORK

PENOLA INC. · NEW YORK · PITTSBURGH

RUST-BAN

Reg. U. S. Pat. Off. by H. O. and R. Co.

HARD-DRYING ALUMINUM COATINGS

NO other single coating meets so many requirements as the aluminum type. It may be used to brighten every surface, indoors or out, to protect against corrosion, or to achieve unusual heat resisting or heat retention properties.

PIGMENT

The pigment in aluminum coatings is made by hammering pure aluminum into tiny, flat flakes. When these flakes are mixed with the vehicle and applied to a surface, many of them rise to the surface of the film. Here they exhibit a most unusual property called "leafing." The flakes form into several layers and so interleaf as to form a practically continuous coat of metal over the surface.

Leafing gives aluminum coating much of its durability and moisture-proofing properties. From this coat of metal also comes the power of reflecting light and heat, the ability to hide all undercoats of paint, and unusual resistance to smoke and fumes.

The vehicle cements together these several layers of aluminum pigment with a thin, tough, elastic film. Thus the vehicle seals the surface and binds the pigment to this surface. The vehicle, in turn, is protected by the metallic sheath formed by the aluminum flakes. This is particularly important as the ultra-violet rays of light are most damaging.

Metal, concrete, plaster—practically all types of surfaces, whether new or previously painted are suitable for the application of these aluminum coatings.

MAXIMUM PROTECTION

Applied over a suitable rust inhibitive primer, aluminum coating is outstanding in protecting metals from corrosion. The coating seals the metal surface against moisture and air, and is in itself resistant to water. Years of successful service of aluminum in such industrial atmosphere as oil refineries prove it is highly resistent to the destructive action

Aluminum coatings provide the triple advantages of rust prevention, heat insulation, and beauty.

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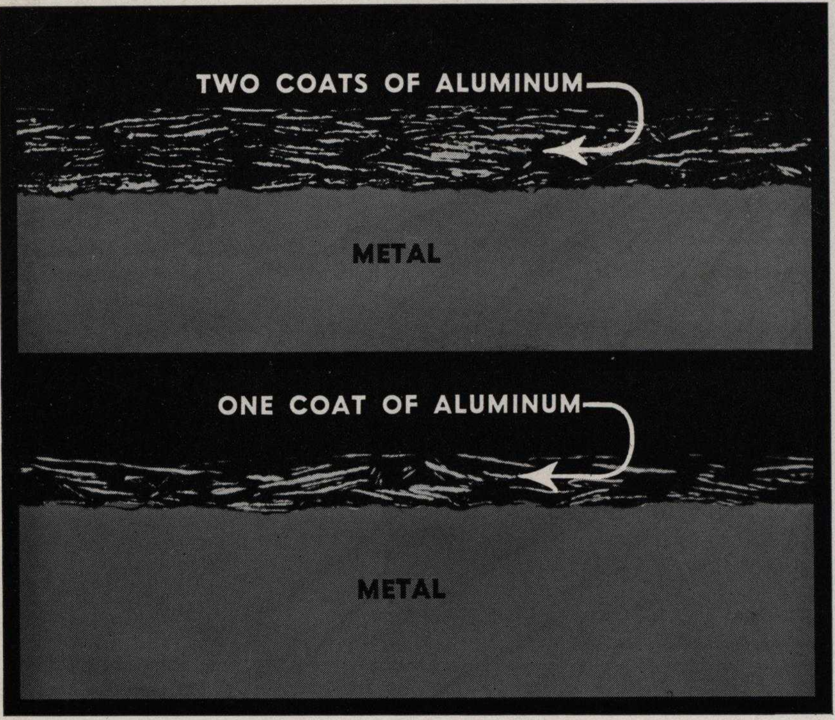


Two cross-section views of aluminum coatings, magnified 100 times to show how the pigment "leafs" and forms parallel layers.

of sunlight and to fumes such as hydrogen sulfide.

EXCELLENT DURABILITY

With sunlight one of the prime causes for paint failure, the metallic coat of aluminum aids considerably by protecting the dried vehicle from the sun's rays. The opaque metal flakes protect against loss of flexibility from cracking, checking, or chalking.

HIDING POWER

The combination of the opaque aluminum pigment and the ability of the pigment to leaf results in a product which will hide any undercolor in a single coat. It is easy to show that aluminum in one coat will form a film as opaque as five coats of white paint.

REFLECTIVITY

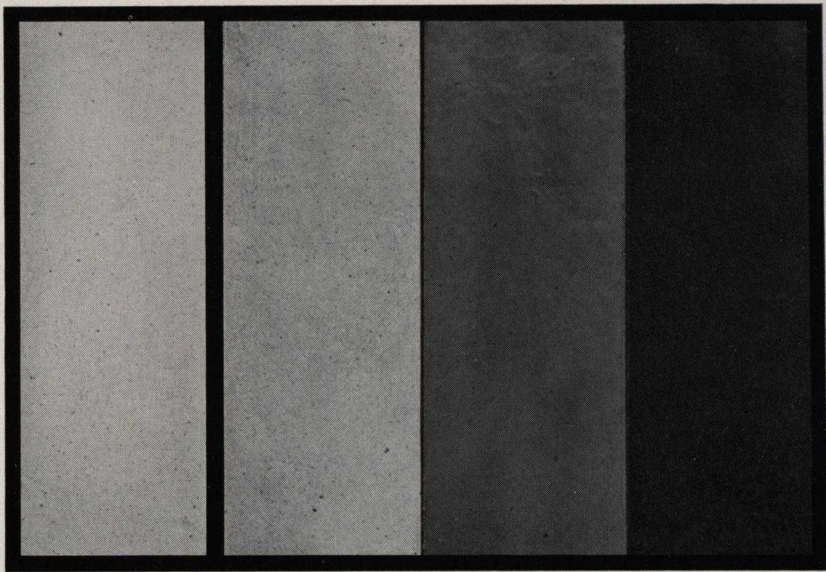
The bright metallic flakes of aluminum pigment reflect light so well that an aluminum coated surface will reflect as much as 60 or 75 percent of the total light falling upon it.

This high reflectivity proves particularly beneficial in industrial applications. It acts as an insulator, keeping buildings and tanks cooler. Storage tanks used for oil or gas are coated with aluminum. The interior of the tank is kept cooler, evaporation losses are less, and lower pressures are created.

The outside surfaces of many boilers and steam pipes are ideal applications for aluminum, as the insulating power of the coating lessens heat losses from these surfaces. This is important, not only from an economy but also from a comfort point of view, experiments having shown cases where boiler room temperatures were reduced at least 15°F. by coating the hot surfaces in the room with aluminum. Oil field boilers painted aluminum have had resulting increases of 7 to 8 percent in boiler horsepower.

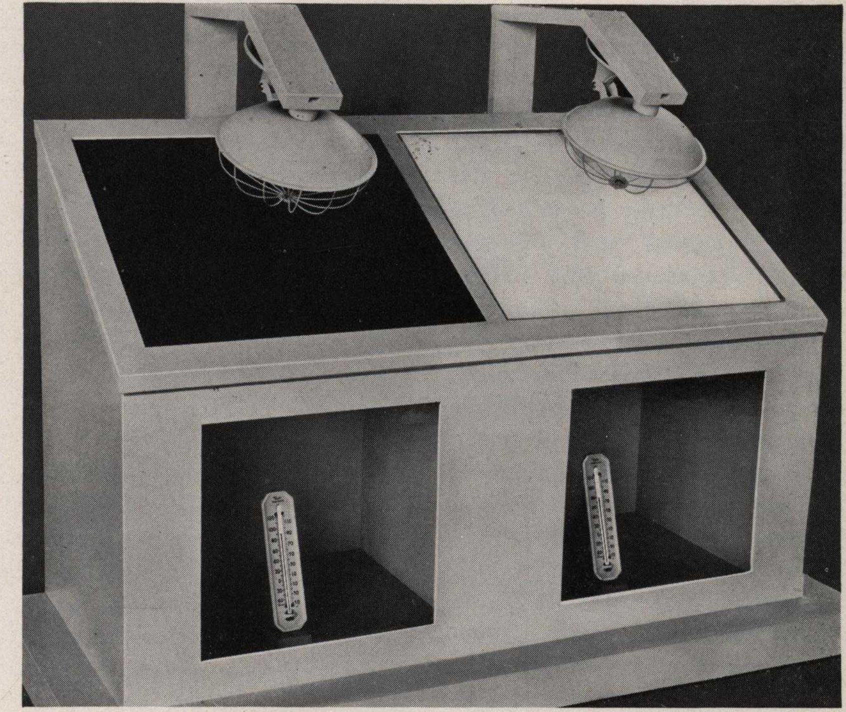
WEIGHT

Weighing about as much as water—a little over eight pounds per gallon—aluminum coating is less than half the weight of many common paints. This contributes somewhat to the ease of brush application. The film dries to a total weight of approximately 5½ lbs. per gallon—a factor of



Proof of aluminum's hiding power. This opacity test compares one coat of aluminum, at left, with five, three, and one coats of white paint.

some importance where weight saving is desirable, as in the case of ships, large bridges, etc.

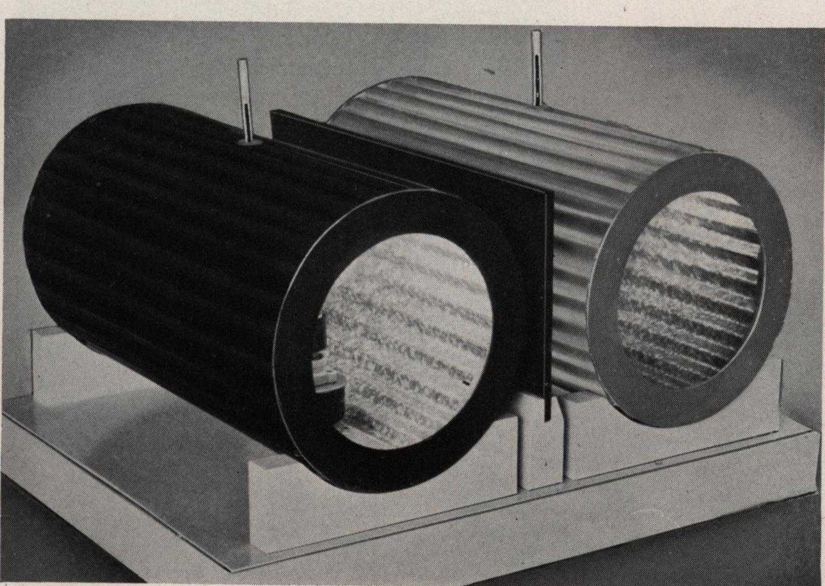


This house is divided into two insulated sections with separate metal roofs painted black and aluminum. Duplicate heat lamps placed above roofs raised the temperatures inside to 90°F. in the black side, and to 80°F. in the aluminum side.

PACKAGING

Aluminum coating is sometimes sold in containers where the pigment and the vehicle are already mixed, and only stirring is required before using. Better results are obtained when aluminum coating is furnished with the vehicle and the pigment in separate compartments. This permits mixing "on the job" just before using.

This special packaging is due to the fact that the aluminum pigment is made with a very minute film of polishing lubricant which is essential to its leafing characteristics. This film slowly disappears on extended contact with the mineral spirits (volatile content) in the vehicle. In order to get maximum performance from aluminum coating, experience has proved that mixing the pigment and the vehicle at the time of application is necessary.



Test showing aluminum's insulating power on the outside of heated surfaces using identical boilers, each with glass fronts and heated by duplicate lamps placed inside. The temperature inside the black painted boiler reached 400°F., while inside the aluminum painted one it reached 430°F.

PASTE OR POWDER

Aluminum pigment is available in paste or powder form. One advantage of the paste is that a finer mesh pigment is used, thus securing a smoother, more brilliant film than possible with the dry powder. Little difference is to be expected other than appearance, although use of paste cuts down loss of pigment due to "dusting" during the mixing operation.

MIXING

Aluminum coating should be thoroughly stirred before using, and occasionally stirred during use to keep the pigment in uniform suspension.

In "on the job" mixing, the pigment should be placed in a clean receptacle and about 10 percent of the vehicle added. This should be thoroughly stirred. Gradual additions of the remainder of the vehicle should be made until a uniform state is obtained and all of the liquid and pigment have been incorporated.

Only enough coating for one day's use should be mixed at any time. That remaining from the previous day may be added to the newly mixed batch, provided it does not exceed 10% of the total mixture.

Aluminum vehicle may be stored indefinitely, as long as the container is kept air tight. While aluminum powder may be stored indefinitely, aluminum paste may dull slightly if stored much over six months.

METHODS OF APPLICATION

Aluminum coating of the proper consistency for brush application should be applied with a minimum number of brushing strokes—all final brush strokes being made in the same direction. Excessive brushing results in a darkened and streaked surface.

Once the coating is brushed and the final wiping strokes lapped with the previously applied sections, *do not touch the work or go over it again no matter how non-uniform it may appear.* If the coating has not been overbrushed and the setting time is not too fast, non-uniformities in the surface will disappear in four or five minutes and the film will dry smooth and brilliant.

Where there are large flat surfaces to be coated, a spray gun is frequently used. The width of the spray should be limited to about 12 inches in order to avoid "fogging." The RUST-BAN in the mixing container should be agitated occasionally to keep it uniform.

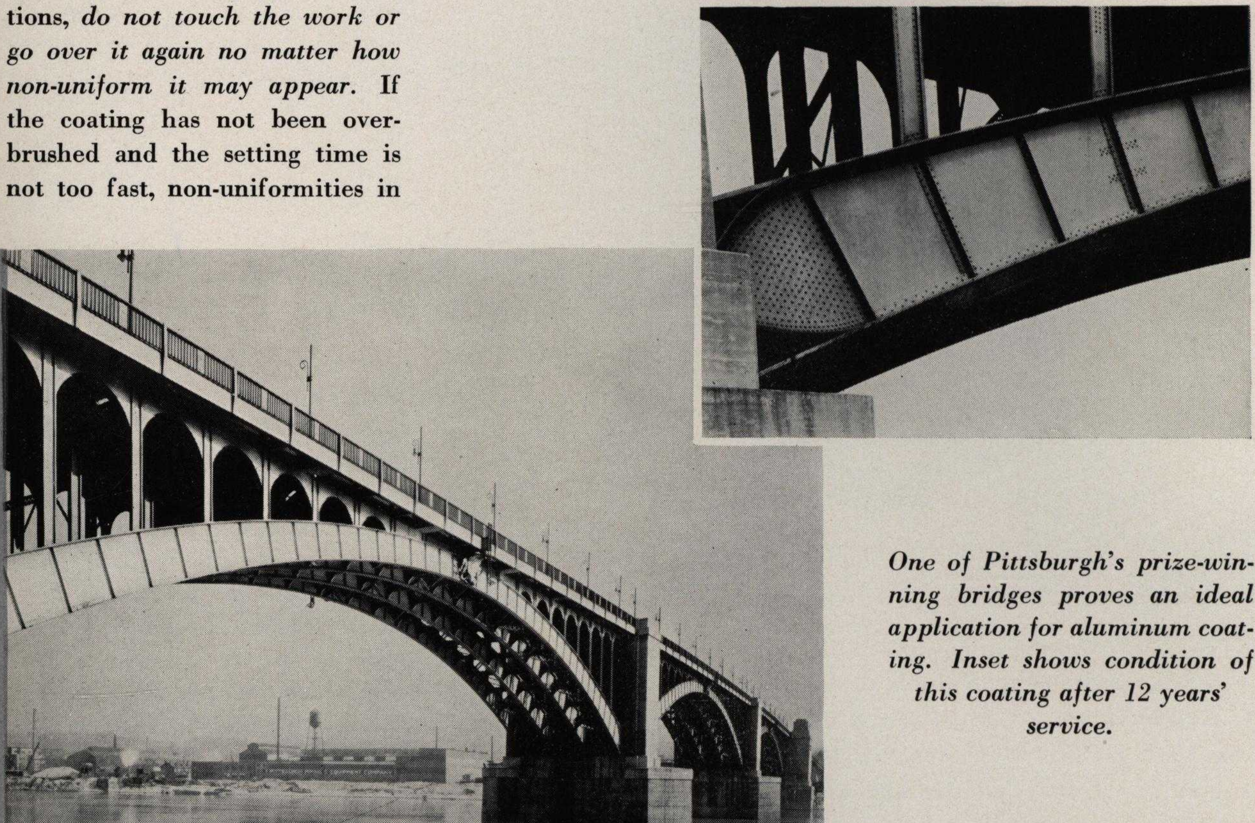
THINNING

A variation in the method of application from the brush method may require thinning. This is particularly true in the case of spraying. Thinning is also necessary to compensate for the effect of cold weather, which thickens the coating. Also, it is necessary to thin where the coating has stood in exposed containers for a long time.

In every case, only RUST-BAN THINNER or mineral spirits free from non-volatile fractions should be used. This may be added up to but not exceeding 10 percent of the total volume (no more than one pint of thinner per gallon). *Do not reduce the amount of powder or the amount of non-volatile material in the vehicle to effect thinning.*

COVERING CAPACITY

The coverage obtained depends on such factors as the smoothness of the surface, the amount of absorption, the consistency, the temperature, and the method of application. It is possible to spread a gallon of aluminum coating over as much as 800 or 850 square feet, but such high coverage is not desirable because it leaves too thin a film for durability. A coverage of about 600 square feet per gallon is more nearly the average which should be maintained for smooth nonabsorptive surfaces. Priming coats on unpainted surfaces will have considerably lower coverage.



One of Pittsburgh's prize-winning bridges proves an ideal application for aluminum coating. Inset shows condition of this coating after 12 years' service.

PREPARATION OF SURFACES

No coating should be applied in wet or freezing weather, or when there is frost or moisture on the surface.

Satisfactory results cannot be obtained unless metal surfaces are thoroughly clean and free from dust, dirt, grease, and any loose adhering material such as scale or rust. Wire brushing, scraping, or sanding may be necessary. Oil and grease should be removed with mineral spirits. A good rust inhibitive primer such as Rust-Ban 263 is recommended.

Brick, concrete, and plaster must be dry and free from dirt, loose plaster, loose paint, and calcimine. Washing the surfaces, followed by scraping and wire brushing, is recommended. These surfaces then should be permitted to dry slowly.

Galvanized iron, although seldom requiring painting when new, is a special problem as its smooth surface offers little chance for paint to bond to it. After it has weathered for at least six months it may be coated readily without using a primer. If it is necessary to coat galvanized iron which has not been exposed to the weather, washing with mineral spirits is necessary to remove the grease and oil left from galvanizing. A good recommended primer should be applied first and well brushed out, after which aluminum coating may be used. Special etching solutions are not required if these methods are carefully followed.

HEATED SURFACES

Rust-Ban aluminum coatings made with the standard long oil varnish vehicle may be used on metal surfaces which reach heats up to 250°F. without discoloration or early failure. They should be applied to clean metallic surfaces without a primer and applied when the surface is cold.

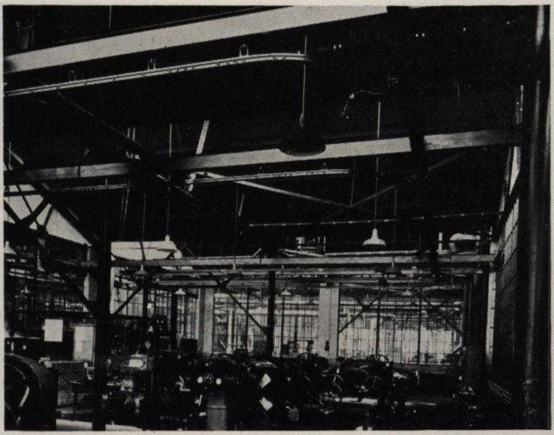
ELECTRICAL EQUIPMENT

Since aluminum coating forms a metallic surface, it is not suitable for use around insulators on electrical equipment and similar locations where it may short circuit the system. One interesting application, however, is the treating of concrete floors in power generating stations, where this metallic floor coating serves to collect stray currents.

Another limitation in the electrical industry is the matter of coating transformers with aluminum. Where these transformers are of the air-cooled type, aluminum is not the best recommendation because it insulates these transformers and cuts down the amount of heat lost by radiation. Artificially cooled transformers with separate radiating systems are not limited in this manner.

NUMBER OF COATS

One coat of any finish is rarely adequate protection for exposed surfaces due to the almost unavoidable defects in the first coat. Tiny pin holes or brush marks are an avenue of attack for corrosive and deteriorating influences. An effectively applied second coat more than doubles the durability and greatly increases the protection afforded the material. Two coats of properly applied aluminum have an impermeability unequalled by any other pigmented coating.



A truthful "Before and After" set of photographs. Industrial interiors, once gloomy, can be transformed like this easily and economically.

RUST-BAN 294 AND 295

Hard, elastic, rust preventive coverings of brilliant aluminum are produced by these two products, Rust-Ban 294 and Rust-Ban 295. This covering not only prevents corrosion, but also greatly improves the appearance of the surface to which it is applied.

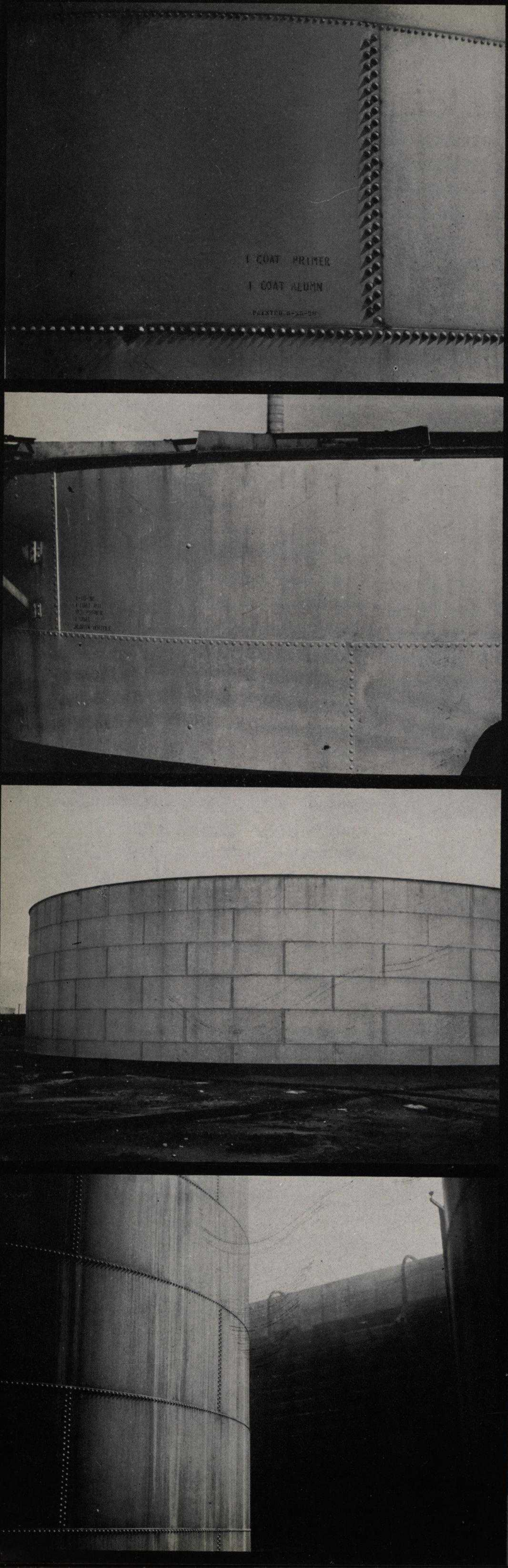
PIGMENT

The only difference between the two is in the pigment. Rust-Ban 294 is sold in a two-compartment container, with the highest grade aluminum *powder* pigment. Rust-Ban 295, sold in the same manner, and with the same vehicle, contains the highest grade aluminum *paste* pigment. The pigment in both cases is supplied in the ratio of two pounds per gallon of vehicle.

VEHICLE

The vehicle is a special long oil varnish base which makes these Rust-Ban products almost universally applicable. It is on the basis of this vehicle that these Rust-Ban products are outstanding among the great variety of aluminum coatings on the market today. Skillfully combined in the vehicle are the processed drying oils and various varnish gums, fluxed with a volatile solvent. It has proper spreading and covering power, normal drying characteristics, and outstanding leafing qualities. This vehicle of proven high quality dries to a tough, elastic film exhibiting high moisture-proofing power and durability. It meets, and often exceeds, specifications drawn for long oil varnish vehicle. It passes a 100% Kauri reduction test (test of the flexibility of the dried film)—whereas most specifications call but for a 60% reduction. It contains better ingredients than are specified for such vehicles—a contribution in the direction of greater life for the coating.

The specifications of the Aluminum Company of America, those of the U. S. Government (Federal Specification TT-V-81), U. S. Navy Specification 52V-15C and those of most cities and states are met by the Rust-Ban vehicle.



These tanks have been coated with Rust-Ban 295 *over two priming coats. Top shows coating after 10 years on tank in refinery storage area. Next is tank after 6 years' exposure to refinery still gases. Third shows 3 year old coating which has been subject to fumes from acid plants. Bottom tank coating is 18 months old after continuous water spray exposure. Such outstanding service proves the quality of the vehicle used in* Rust-Ban *295.*

DRYING TIME

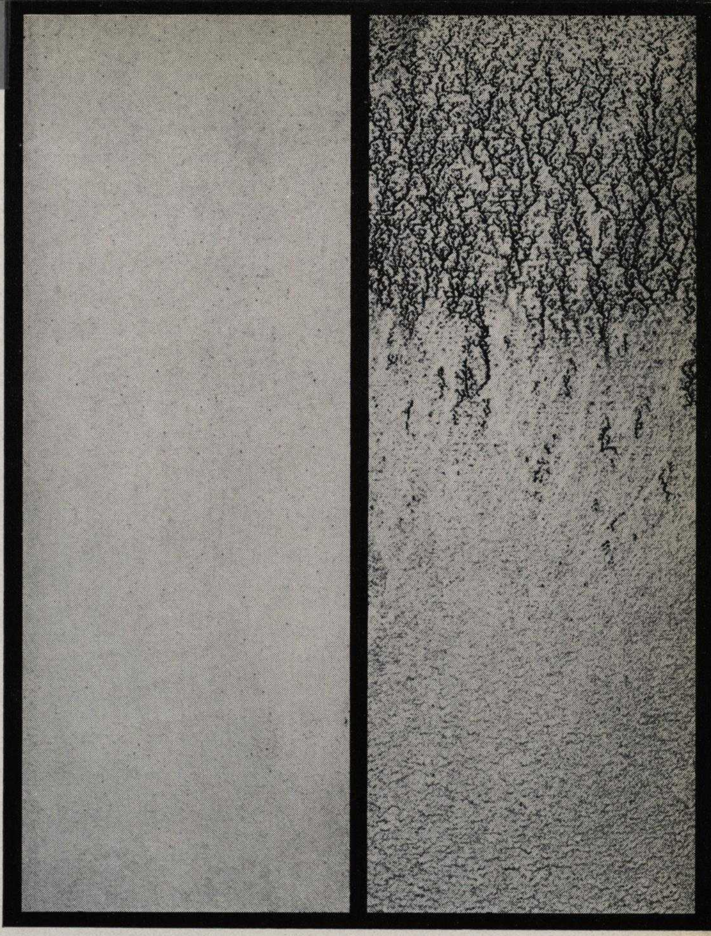
Rust-Ban aluminum coatings will "set to touch" in about four hours, and will dry hard in eighteen hours under average drying conditions. Variations from normal summer temperatures and humidity may affect these drying times.

MIXING

Mixing is accomplished in the usual manner for aluminum coatings. Under ordinary conditions these products are of the proper consistency for easy application by all common methods. Thinning may be desirable to replace volatile material lost upon standing, or to make spray painting easier. In all thinning the amount of vehicle and the amount of pigment must never be reduced. Use only Rust-Ban Thinner 360 (Safety Solvent Type).

PERFORMANCE

The service which may be expected of aluminum coating is so dependent on the character of the surface, the skill with which priming and finishing coats were applied, and the moisture and corrosive conditions of the atmosphere that no blanket recommendations or guarantees can be made. Where unusual conditions are encountered, the makers of Rust-Ban will be pleased to make specific recommendations.



Test panels painted with different aluminum coatings and hung vertically. The panel at the left illustrates the result obtained with Rust-Ban; *at the right is the result of using an inferior vehicle.*

TYPICAL APPLICATIONS

Aviation

Aircraft, fabric coating, airships, hangars, factories, markers, etc.

Electric Power and Light

Instruments, structures, transmission towers, oil-cooled transformers, etc.

Food Manufacturers

Canneries, bakeries, ice plants, dairies, refrigerator rooms, pickling rooms.

Garages

Interiors and exteriors, tanks, pumps, equipment.

Gas Plants

Pressure storage tanks, pipe lines, structures, etc.

Industrial Plants

Structures, walls, machinery, elevated water towers, tanks, drums, pails, equipment, manufactured products, etc.

Manufactured Articles

Equipment, parts, machinery, containers, sporting goods, toys, etc.

Marine Industry

Companionways, engine rooms, ship plate, rooms, pipe lines, etc.

Mining Industry

Breakers, pipe lines, underground rooms, steel towers, structures, etc.

Oil Industry

Refinery equipment, structures, pipe lines, storage tanks, tank cars, drums, etc.

Railroads

Bridges, rolling stock, round houses, water tanks, signals, towers, etc.

State, County, and Municipal

Bridges, park and playground equipment, lamp posts, flag poles, fire hydrants, traffic signals, structures, etc.

Textile Industry

Dye houses, weaving rooms, frames, etc.

PENOLA INC.

CHICAGO PITTSBURGH
ST. LOUIS DETROIT

RUST-BAN
Reg. U. S. Pat. Off. by H. O. and R. Co.

MISCELLANEOUS PRODUCTS

RUST preventives for every purpose in industry are included in the Rust-Ban group of products. Separate bulletins discuss the non-drying and hard-drying types of coatings available. Included in this bulletin are descriptions of the several coatings and thinners which fall into a "miscellaneous" classification because of their specialized application or composition.

RUST-BAN 208

Rust-Ban 208 is a non-pigmented black varnish recommended where a dark colored coating of good durability is desired. It contains an exceptionally pure form of asphalt in a varnish solution. Upon drying it forms a tough flexible film valuable in arresting corrosion and excellent in weather-resistance under severe exposure conditions. The coating has "self-healing" properties, and when thoroughly dry has characteristics resembling rubber.

Rust-Ban 208 forms a rust preventive coating not only on new steel surfaces but also on old surfaces or structures which are still serviceable. The life of the protective film is excellent for products of this type, not so permanent as the much more expensive rust inhibitive paints, but offering economical protection in the presence of moisture and mildly corrosive solutions or fumes.

This product is of the right consistency for brush application, but may be thinned for wipe, dip, or spray methods. On shiny metal the result of a thin coat may be a dark brown film, two coats being necessary in such cases to secure maximum opacity. This product sets to touch in about 3 hours under normal summer temperatures, after which it may be handled without damage to the film.

Rust-Ban *208 is an efficient, durable, black coating for protection of many metal surfaces during outdoor exposure.*

TYPICAL APPLICATIONS

Metal superstructure
Surface pipe lines
Tank exteriors
Machinery
Tractors
Protection against
  brine drippings
Road building equipment
Contractor's equipment
Metal fences
Pipe in storage
Fittings in storage
Toys
Sporting goods
Manufactured articles

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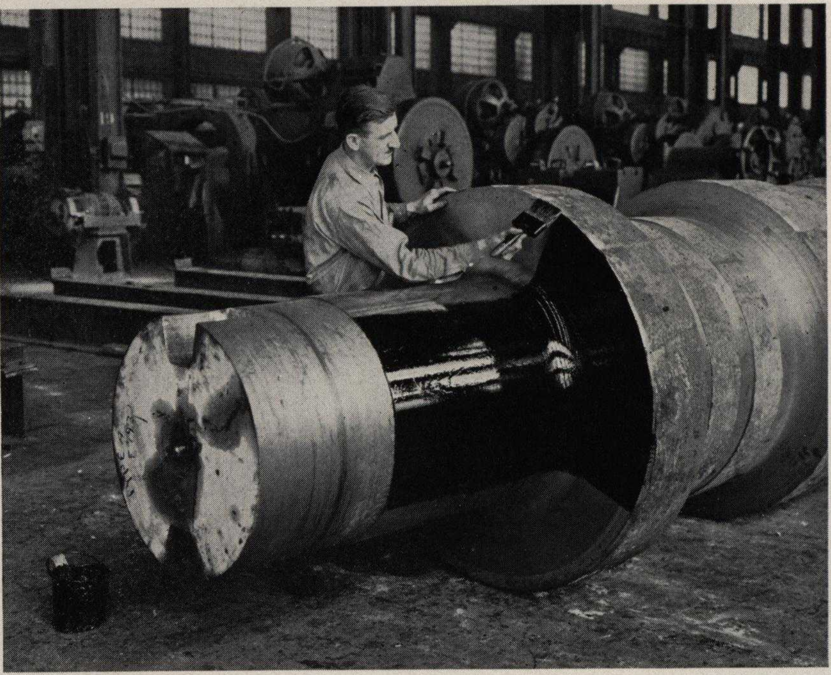
Rust-Ban 208 is not recommended for underground use on piping. In such applications the corrosive and deteriorating soil conditions are very destructive. Rust-Ban 327, protected by exterior wrappings, is a superior rust preventive for underground piping.

When painting over Rust-Ban 208 with other type paints, the black color may bleed through the top paint. Aluminum paint is a possible exception as it resists bleeding-through better than other paints.



Large steel mill roll which is to be finish machined at a later date uses bituminous coating to protect the roll neck bearings.

SURFACE PREPARATION

The surface to be treated should be dry, clean, and free from mill scale, dirt, and rust. Oil and grease should be removed by washing with Rust-Ban Thinner—*do not use kerosene.*

Surfaces that have been previously painted or are badly corroded should be wire brushed and cleaned. This product will penetrate and arrest rust development, but rust particles adhering to the surface destroy the bond between the coating and the metal.

Rust-Ban 208 should not be applied when the surface shows signs of moisture, condensation, or frost, as this would tend to permit corrosion to take place under the film and cause the coating to peel and crack.

MAXIMUM COVERAGE

The coverage to be expected, in terms of square feet per gallon, varies considerably with the consistency, the thickness of the applied film, the technique of the workman, and the method of application. Thin first coats on nonabsorptive metal surfaces should cover 600 to 700 square feet per gallon. Greater coverage than this usually results in a film so thin that surface protection is greatly reduced.

RUST-BAN 209

This bituminous coating gives a hard, glossy, black finish. It is intended for protection of exterior metal parts. Typical applications are similar to Rust-Ban 208 and also include bridges, meters, and automotive chassis parts.

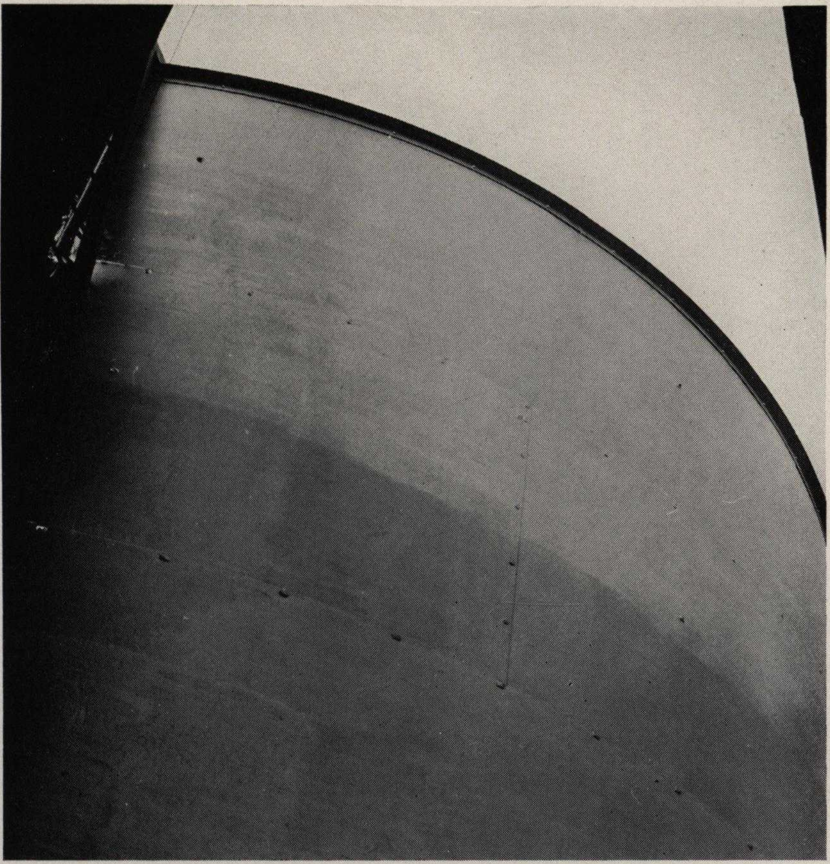
Rust-Ban 209 gives a permanent type, non-removable coating. It is a fluid product which is easily applied by brush or spray. On drying, it forms an elastic covering which resists cracking and peeling.

Rust-Ban 209 is compounded to inhibit and prevent rust. Its use provides very good corrosion resistance, particularly when it is applied over the rust inhibitive primer, Rust-Ban 263. The comments under Rust-Ban 208 regarding surface preparation also apply when using Rust-Ban 209.

This product is of the correct consistency for application as received. Where thinning is considered desirable, no more than one pint of Rust-Ban Thinner 360 per gallon of coating is to be added. Under average drying conditions the coating will set to touch in 3 hours and dry hard in 24 hours. Recommended coverage is approximately 400 square feet per gallon.

RUST-BAN 263

Priming metal surfaces prior to the application of hard-drying coatings of the aluminum or bituminous type is the purpose of Rust-Ban 263. It is a reddish brown coating which dries to



This tank has been freshly painted with aluminum. Properly mixed paint was used at the top, but it was then thinned by adding more vehicle, giving the poor effect shown on the lower portion. Had Rust-Ban Thinner *been used instead, the coating would have been uniformly durable and attractive.*

form a durable, adhering base coat. Its composition of red lead and iron oxide gives it the rust inhibitive properties desirable in arresting any corrosive attack which may penetrate the surface coat applied over this primer.

Application is by brush or spray. The consistency is such that thinning is ordinarily not needed. If thinning should be desired, no more than one pint of Rust-Ban Thinner 360 per gallon of primer should be added. The surface to which this primer is applied must be free of moisture, scale, rust, and dirt. See comments under Rust-Ban 208.

This product is slow-drying, requiring 6 hours to set to touch and 24 hours to dry hard. It must be thoroughly dry before applying the finish coat. Coverage approximates 550 square feet per gallon.

Rust-Ban 263 is specifically recommended for priming metal surfaces prior to the application of Rust-Ban 294 or 295.

RUST-BAN THINNER 360
(SAFETY SOLVENT TYPE)

This product is a special solvent which is designed for use with other Rust-Ban products. It may be added to reduce the consistency of a product to permit easier application by spray or dip methods. Where a Rust-Ban product has thickened from continued exposure to the air, Rust-Ban 360 may be used to restore the product to its original consistency.

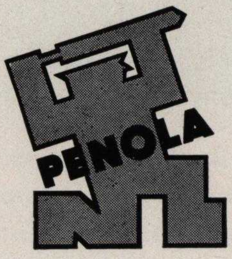
Additional uses are many, including cleaning as a means of surface preparation prior to application of Rust-Ban products or where Rust-Ban is removed from metal surfaces which are to be processed further.

It is important that this product, or one meeting the same specifications and high standard of refinement, be used exclusively with Rust-Ban products. Kerosene, turpentine, and such thinners must not be used.

Rust-Ban Thinner 360 (Safety Solvent Type) has a guaranteed minimum flash point of 100°F. and this contributes a material safety factor to the handling of products thinned with this solvent.

RUST-BAN THINNER 365
(QUICK DRYING TYPE)

This solvent is also designed for use with Rust-Ban products. It has faster evaporating characteristics than the Safety Solvent Type and, consequently, a flash point lower than room temperature. Its applications are the same as those of Rust-Ban 360, but it is especially preferred for fast drying, spray applied Rust-Ban grades.



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